

SEQUENCE LISTING

<110> Ding, Jeak Ling
Lim, Eng Hwa
Lam, Toong Jin
National University of Singapore

<120> Recombinant Vitellogenin Enriched Feed

<130> 040184-000300US

<140> US 10/534,657

<141> 2005-05-10

<150> US 60/425,263

<151> 2002-11-12

<150> WO PCT/SG03/00266

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<170> PatentIn Ver. 2.1

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protein precursor mRNA

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 <223> domestic silkworm vitellogenin

<400> 3

Met	Lys	Leu	Phe	Val	Leu	Ala	Ala	Ile	Ile	Ala	Ala	Val	Ser	Ser	Asp
1				5					10					15	
Arg	Phe	Ser	Ser	Gln	Ser	Gln	Ser	Thr	Gly	Gly	Gln	Thr	Tyr	Pro	Ser
			20					25					30		
Pro	Trp	Gln	Val	Gly	Lys	Gln	Tyr	Arg	Tyr	Glu	Val	Thr	Ser	Arg	Thr
		35					40					45			
Leu	Ala	His	Leu	Gln	Glu	Gly	Pro	Ser	Ser	Gly	Ser	Ala	Phe	Lys	Ala
	50					55					60				
Gln	Phe	Thr	Ile	Arg	Val	Lys	Ser	Pro	Gly	Arg	Leu	Gln	Ala	Lys	Leu
65					70					75					80
Glu	Asn	Pro	Gln	His	Gly	Asn	Phe	Asn	Glu	Gln	Leu	Pro	Asp	Pro	Arg
				85					90					95	
Glu	Leu	Pro	Val	Asp	Leu	Lys	Tyr	Gln	Pro	Thr	Pro	Asn	Ile	Asp	Lys
			100					105					110		
Val	Phe	Glu	Ile	Glu	Ile	Asp	Gly	Gly	Arg	Ile	Val	Ser	Leu	Asp	Phe
		115					120					125			
Pro	Thr	Ser	Val	Pro	Val	Pro	Gln	Glu	Asn	Leu	Ile	Lys	Gly	Leu	Ile
	130					135					140				
Ser	Ala	Leu	Gln	Leu	Asp	Thr	Ser	Ala	His	Arg	Val	Ile	His	Asp	Ser
145					150					155					160
Gln	Asn	Asn	Tyr	Asp	Arg	Glu	Gln	Gln	Gln	Gly	Leu	Phe	Arg	Lys	Met
				165					170					175	
Glu	Thr	Asp	Val	Thr	Gly	Asp	Cys	Glu	Thr	Leu	Tyr	Thr	Val	Ser	Pro
			180					185					190		
Val	Ala	Ser	Glu	Trp	Arg	Arg	Glu	Leu	Pro	Lys	Phe	Ala	Asn	Glu	Gln
		195					200					205			
Asp	Pro	Val	Glu	Val	Thr	Lys	Ser	Thr	Asn	Tyr	Gly	His	Cys	His	His
	210					215					220				
Arg	Val	Ala	Tyr	His	Phe	Gly	Val	Pro	Val	Gly	Ala	Glu	Trp	Thr	Gly
225					230					235					240
Thr	Ala	His	Lys	Thr	Gln	Glu	Gln	Gln	Leu	Ile	Gly	Arg	Ala	Thr	Tyr
			245						250					255	
Ser	Arg	Ile	Leu	Thr	Gly	Lys	Glu	Gly	Pro	Ile	Tyr	Lys	Ala	Glu	Thr
		260						265					270		
Thr	Ser	Thr	Val	His	Val	His	Pro	His	Leu	Tyr	Gly	Lys	Gln	Lys	Ala
		275					280					285			
Glu	Val	Tyr	Ser	His	Val	His	Met	Glu	Leu	Ile	Ser	Val	Asp	Gln	Asp
	290					295					300				
Ser	Gly	Ala	Glu	Trp	Pro	Arg	Ala	Gly	Ala	Met	Arg	Pro	Ala	Gln	Ser
305					310					315					320

Ile	Leu	Tyr	Ser	Leu	Ser	Thr	Lys	Gln	Met	Thr	Lys	His	Tyr	Glu	Ser	325	330	335
Ser	Ser	Ser	Ser	Ser	Ser	Ser	Glu	Ser	His	Glu	Phe	Asn	Phe	Pro	Glu	340	345	350
Gln	His	Glu	His	Pro	His	Gln	Ser	Asn	Gln	Arg	Ser	Arg	Arg	Ser	Tyr	355	360	365
Met	Arg	Ser	Lys	Leu	Val	Thr	Val	His	Lys	Val	Leu	Lys	Lys	Arg	Asn	370	375	380
Ser	Glu	Ser	Ser	Ser	Gly	Ser	Ser	Ser	Ser	Ser	Ala	Asp	Ser	Ser	Ser	385	390	395
Thr	Tyr	Ile	Asn	Asp	Asp	Ile	Pro	Asp	Ile	Asp	Glu	Pro	Ala	Tyr	Ala	405	410	415
Ala	Leu	Tyr	Met	Ser	Pro	Gln	Pro	His	Ala	Asp	Lys	Lys	Gln	Asn	Ala	420	425	430
Met	Asn	Ala	Gln	Lys	Ile	Leu	Gln	Asp	Ile	Ala	Gln	Gln	Leu	Gln	Asn	435	440	445
Pro	Asn	Asn	Met	Pro	Lys	Ser	Asp	Phe	Leu	Ser	Lys	Phe	Asn	Ile	Leu	450	455	460
Val	Arg	Leu	Ile	Ala	Ser	Met	Ser	Thr	Glu	Gln	Leu	Ser	Gln	Thr	Ser	465	470	475
Arg	Ser	Ile	Glu	Thr	Ala	Lys	Thr	Ser	Asn	Asn	Ile	Ile	Lys	Ser	Asp	485	490	495
Met	Trp	Met	Ile	Phe	Arg	Asp	Gly	Val	Thr	Gln	Ala	Gly	Thr	Leu	Pro	500	505	510
Ala	Phe	Lys	Gln	Ile	Gln	Ser	Trp	Ile	Glu	Asn	Lys	Lys	Ile	Gln	Glu	515	520	525
Glu	Glu	Ala	Ala	Gln	Val	Val	Val	Ala	Leu	Pro	Arg	Thr	Leu	Arg	Tyr	530	535	540
Pro	Thr	Lys	Gln	Ile	Met	Thr	Gln	Phe	Phe	Asn	Phe	Ala	Arg	Ser	Pro	545	550	555
Ala	Val	Lys	Asp	Gln	Met	Phe	Leu	Asn	Ser	Ser	Ala	Leu	Met	Ala	Ala	565	570	575
Thr	Lys	Leu	Ile	Asn	Leu	Gly	Gln	Val	Asn	Asn	Tyr	Thr	Ala	His	Ser	580	585	590
Tyr	Tyr	Pro	Thr	His	Met	Tyr	Gly	Arg	Leu	Thr	His	Lys	His	Asp	Ala	595	600	605
Phe	Val	Leu	Glu	Glu	Ile	Leu	Pro	Thr	Leu	Ala	Ala	Asp	Leu	Lys	Ala	610	615	620
Thr	Val	Glu	Tyr	Lys	Asp	Ser	Thr	Lys	Ala	Gln	Val	Tyr	Ile	Gln	Ala	625	630	635

Ile Gly Asn Leu Gly His Arg Glu Ile Leu Lys Val Phe Ala Pro Tyr
 645 650 655
 Leu Glu Gly Lys Val Glu Ile Ser Thr Tyr Leu Arg Thr His Ile Val
 660 665 670
 Lys Asn Leu Lys Thr Leu Ala Lys Leu Arg Asp Arg His Val Arg Ala
 675 680 685
 Val Leu Phe Ser Ile Leu Arg Asn Thr Ala Glu Pro Tyr Pro Val Arg
 690 695 700
 Val Ala Ala Ile Gln Ser Ile Phe Ile Ser His Pro Thr Gly Glu Met
 705 710 715 720
 Met Gln Ala Met Ala Glu Met Thr His Asn Asp Pro Ser Val Glu Val
 725 730 735
 Arg Ala Val Leu Lys Ser Ala Ile Leu Ser Ala Ala Glu Leu Gln His
 740 745 750
 Pro Arg Asn Phe Tyr Leu Ser Arg Thr Ala Gln Ala Ala Arg Tyr Leu
 755 760 765
 Val Thr Asn Glu Glu Phe Gly Tyr Gln His Ser Phe Lys Phe Ile Asp
 770 775 780
 Asp Ser Tyr Asp Glu Asp Asn Asp Ile Gly Thr Phe Val Ile Ser His
 785 790 795 800
 Ile Gly Ser Glu Asp Ser Leu Leu Pro Lys Asp Phe Lys Ile Val Thr
 805 810 815
 Asn Ser Lys Gly Gly Ala Trp Glu Arg Asn Thr Ile Glu Ala Ser Phe
 820 825 830
 Ser Ser Ala Glu Arg Phe Leu Asp Tyr Leu Arg Asp Ser Val Phe Ala
 835 840 845
 Pro His Pro Lys Phe Asp Arg Ala His Lys Tyr Ser Ala Glu Lys Ile
 850 855 860
 Ala Lys Leu Leu Asn Ile Lys Asn Asp Glu Glu Glu Pro Leu Glu Ala
 865 870 875 880
 Ser Phe Tyr Val Asp Phe Met Asn Asn Gln Arg Leu Phe Ser Phe Ser
 885 890 895
 Glu Ser Asp Leu Gln Gln Leu Ser Gln Tyr Ile Ser Glu Tyr Met Lys
 900 905 910
 Lys Val Glu Ser Gly Ala Glu Lys His Tyr Thr Lys Val Tyr Asn Gln
 915 920 925
 Asp Gln Val Ser Ile Met Phe Pro Val Ala Ser Gly Met Pro Phe Ile
 930 935 940
 Phe Lys Tyr Lys Glu Pro Ala Val Ile His Phe Gln Ser Lys Leu Lys
 945 950 955 960

Gly	Lys	Phe	Ser	Phe	Pro	Ser	Lys	Asp	Asn	Lys	Tyr	Tyr	Glu	Ala	Asn	
				965					970						975	
Met	Ile	Lys	Asp	Val	Gln	Phe	Thr	Tyr	Ala	Ile	Asn	Ile	Asp	Gly	Asn	
			980					985					990			
Val	Gly	Phe	Met	Asp	Thr	Leu	Ser	Asn	Gln	Tyr	Ser	Ser	Val	Gly	Val	
		995					1000					1005				
Val	Asn	Lys	Leu	Gln	Phe	Asn	Ile	Pro	Phe	Lys	Phe	Gly	Ile	Glu	Ile	
	1010					1015					1020					
Lys	Ser	Gly	Leu	Ile	Lys	Phe	Arg	Val	Glu	Pro	Leu	His	Pro	Asp	Gln	
1025					1030					1035					1040	
Asp	Gln	Thr	Leu	Val	His	Tyr	Ser	Val	Trp	Pro	Tyr	Ser	Ala	Ser	Gln	
			1045						1050					1055		
Lys	Lys	Asp	Ser	Leu	Val	Ala	Ile	Ser	Gln	Asp	Pro	Ala	Thr	Lys	Ile	
		1060						1065					1070			
Val	Glu	Arg	Arg	Ser	Lys	Val	Phe	Ser	Val	Asp	Ser	Lys	Tyr	Gly	Gln	
	1075						1080					1085				
Ser	Thr	His	Ala	Val	Ile	Tyr	Ala	Gln	Gly	Tyr	Thr	Tyr	Ser	Ser	Asp	
	1090					1095					1100					
Trp	Arg	Asn	Phe	Gly	Ala	Lys	Phe	Thr	Ser	Arg	Asp	Tyr	Phe	Thr	Asn	
1105				1110						1115					1120	
Leu	Ala	Ser	Leu	Leu	Thr	Gln	Glu	Asp	Ile	Ala	Leu	Thr	His	Phe	Asn	
			1125					1130						1135		
Leu	Lys	His	Leu	Cys	Lys	Gln	Ser	Gln	Ser	Lys	Ala	Leu	Thr	Ile	Thr	
		1140						1145					1150			
Ala	Tyr	Tyr	Asp	Glu	Tyr	Tyr	Asn	Gln	Gln	Asn	Ser	Gly	Ile	Leu	Thr	
	1155						1160					1165				
Asp	Ala	Thr	Asp	Arg	Asn	Asp	Leu	Ser	Pro	Asn	Ser	Glu	Thr	Arg	Arg	
	1170					1175					1180					
Ala	Glu	Met	Val	Lys	Leu	Val	Ser	Ala	Gly	Ile	Asn	Lys	Ala	Arg	Val	
1185					1190					1195					1200	
Arg	Val	Val	Asp	Leu	Ser	Ala	Ser	Phe	Glu	Gly	Ser	Gln	Asp	Gln	Asn	
			1205						1210					1215		
Tyr	Val	Leu	Thr	Gly	Thr	Trp	Gly	Asp	Ser	Pro	Val	Asp	Ser	Lys	Val	
		1220						1225					1230			
Gln	Gly	Met	Leu	Phe	Ala	Gly	Thr	Lys	Ser	Ala	Thr	Gln	Gly	Asn	Gln	
	1235						1240						1245			
Gln	Ile	Asn	Ala	Val	Phe	Ala	Thr	Thr	Lys	Pro	Glu	Ile	His	Ser	Leu	
	1250					1255					1260					
Ser	Phe	Ser	Lys	Pro	Leu	Gln	Ser	Asp	Leu	Arg	Ala	Pro	Phe	Gly	Met	
1265					1270					1275					1280	

His Phe Lys Tyr Gly Gln Ser Gly Glu Ile Arg Val Ser Gly Ser Phe
 1285 1290 1295
 Asp Arg Thr Lys Lys Tyr Thr Thr Glu Leu Glu Asn His Pro Leu Ala
 1300 1305 1310
 Lys Gln Cys Ser Gln Gln Thr Thr Leu Asn Asn Phe Tyr Gln Asp Ser
 1315 1320 1325
 Cys His Lys Ala Ile Val Met Ala His Ala Pro Asp His Val Glu Phe
 1330 1335 1340
 Ser Val Ser Phe Gln Asp Met Ser Pro Gln Tyr Arg Asn Phe Ser Tyr
 1345 1350 1355 1360
 His Thr Tyr Arg Leu Tyr Glu Tyr Leu Gly Tyr Trp Tyr Thr Glu Ala
 1365 1370 1375
 Asn Pro Leu Lys Leu Thr Gln Asn Gly Lys Met Asp Phe Lys Ile Asp
 1380 1385 1390
 Phe Ser Tyr Phe Asp Arg Thr Tyr Thr Val Asp Ile Ala Ser Pro Ser
 1395 1400 1405
 Gly Glu Ala Arg Met Arg Asp Met Pro Ile Ala Thr Met Ala Pro Gly
 1410 1415 1420
 Ala Leu Ser Phe Tyr Gln Pro Leu Lys Ala Tyr Glu Leu Val Ala Asn
 1425 1430 1435 1440
 Tyr Phe Thr Gly His Gln Tyr Gln Pro Tyr Cys Ser Ile Asp Gly Thr
 1445 1450 1455
 Arg Ile His Thr Phe Ser Asn Arg Ser Tyr Glu Tyr Pro Leu Ser Arg
 1460 1465 1470
 Ser Trp His Val Val Met Gln Asp Glu Ser Thr Gln Arg Gly Asn Trp
 1475 1480 1485
 His Glu Leu Ala Ile Leu Ser Arg Arg Gln Gln Arg Asp Gln Gln Glu
 1490 1495 1500
 Ile Tyr Ile Ser Tyr Lys Ser Glu Ser Gly Gln Asp Leu Glu Ile Glu
 1505 1510 1515 1520
 Ile Gln Pro Ala Ser Gly Asp Ser Ala Tyr Gln Val Lys Val Thr Thr
 1525 1530 1535
 Asn Thr Lys Lys Ile Thr Asp Asp Asp Leu Thr Met Tyr Trp Asp Asp
 1540 1545 1550
 Val Lys Glu Gln Pro Phe Leu Gln Tyr His Thr His Lys Asp Gly Val
 1555 1560 1565
 Leu Val Ile Asn Ile Glu Asp Asp Arg Ile Arg Ala Ile Tyr Asp Gly
 1570 1575 1580
 Gln Arg Phe Val Val Phe Thr Gln Asp Tyr Arg Asn Ser Thr Arg Gly
 1585 1590 1595 1600

Ile Cys Gly Arg Met Ser Gly Glu Gln Arg Asp Asp Tyr Leu Thr Pro
 1605 1610 1615
 Glu Gly Leu Val Asp Lys Pro Glu Leu Tyr Ala Ala Ala Tyr Ser Leu
 1620 1625 1630
 Asn Glu Glu Asn Ser Asp Pro Lys Thr Gln Glu Leu Lys Ala Leu Ala
 1635 1640 1645
 Thr Gln Gln Ala Tyr Tyr Pro Glu Tyr Lys Tyr Thr Ser Ile Leu Arg
 1650 1655 1660
 Ser Asp Pro Thr Trp Gln Glu Glu Ser Gln Ser Cys Gly Glu Asp Gln
 1665 1670 1675 1680
 Trp Gln Ser Glu Thr Val Tyr Lys Ser Arg Ser Tyr Asp Lys His Lys
 1685 1690 1695
 Gly Ala Cys Glu Val Arg Gln Gln Val Gln Phe Tyr Glu Asn His Gly
 1700 1705 1710
 Asp Ile Cys Ile Thr Thr Ser Arg Val Pro Ser Cys Gln Ser His Cys
 1715 1720 1725
 Arg Ala Gly Asp Tyr Lys Ile Gln His Val Gln Val Thr Cys Lys Ser
 1730 1735 1740
 Lys Leu Asp His Asp Phe Arg Met Tyr Lys Glu Gln Ile Lys Lys Gly
 1745 1750 1755 1760
 Gln Asn Pro Glu Val Ser Gly Ile Pro Ser Val Lys Gln Phe Lys Val
 1765 1770 1775
 Pro Val Thr Cys Gln Pro
 1780

<210> 4
 <211> 1747
 <212> PRT
 <213> Lymantria dispar

<220>
 <223> gypsy moth vitellogenin

<400> 4
 Met Arg Leu Leu Leu Ile Ser Ala Phe Ile Ala Val Val Ser Ser Ser
 1 5 10 15
 Pro Leu Thr Glu Pro Gln Pro Val His Gln Gln Ser Pro Trp Gln Asn
 20 25 30
 Gly Lys Gln Tyr Leu Tyr Glu Val Asn Ser His Thr Leu Ser His Phe
 35 40 45
 Tyr Glu Gly Thr Ser Ser Gly Asn Ala Phe Lys Ala Asn Phe Ile Ile
 50 55 60
 Arg Val Thr Ala Gln Gly Leu Leu Gln Ala Lys Leu Glu Glu Pro Arg
 65 70 75 80

Arg	Ala	Gln	Phe	His	Gln	Lys	Leu	Asp	Asn	Lys	Met	Gln	Ile	Pro	Ala	85	90	95
Asp	Leu	Lys	Tyr	Thr	Asn	Val	Val	Asn	Leu	Asp	Gln	Pro	Phe	Glu	Ile	100	105	110
Ser	Phe	Asp	Gly	Gly	Arg	Ile	Leu	Ser	Leu	Arg	Leu	Pro	Glu	Val	Leu	115	120	125
Ser	Val	Ala	Asn	Glu	Asn	Leu	Leu	Lys	Gly	Leu	Ile	Ser	Thr	Leu	Gln	130	135	140
Val	Asp	Leu	Thr	Asn	Tyr	Arg	Leu	Val	Asn	Arg	Ser	Gln	Asp	Ser	Tyr	145	150	155
Asp	Lys	Asn	Ser	Gln	Gln	Gly	Leu	Phe	Ser	Lys	Phe	Glu	Thr	Asp	Val	165	170	175
Thr	Gly	Asp	Cys	Glu	Thr	Val	Tyr	Ser	Val	Ser	Pro	Val	Asn	Ala	Glu	180	185	190
Trp	Arg	Arg	Glu	Val	Pro	His	Phe	Ala	Ser	Asp	Ser	Ala	Pro	Ile	Gln	195	200	205
Ile	Thr	Lys	Ser	Lys	Asn	Tyr	Asn	Arg	Cys	His	Gln	Cys	Ile	Ile	Tyr	210	215	220
Asn	Phe	Gly	Val	Pro	Arg	Gly	Ala	Leu	Trp	Thr	Gly	Ile	Ala	His	Gly	225	230	235
Asn	Thr	Glu	Lys	Gln	Phe	Ile	Ser	His	Thr	Thr	Val	Ser	Arg	Ile	Leu	245	250	255
Val	Gly	His	Gln	Gly	Ile	Tyr	Asn	Thr	Glu	Thr	Thr	Ser	Ser	Val	Asn	260	265	270
Val	His	Pro	His	Ile	His	Gly	Arg	Gln	Lys	Ala	Glu	Val	His	Ser	Tyr	275	280	285
Ile	Gln	Met	Arg	Leu	Lys	Ser	Ile	Glu	Glu	Asn	Pro	Gly	Thr	Asn	Trp	290	295	300
Gln	Lys	Pro	Glu	Ala	Thr	Arg	His	Val	Lys	Ser	Leu	Leu	His	Ser	Met	305	310	315
Leu	Thr	Lys	Gln	Val	Gln	Asn	Ser	Tyr	Gln	Ala	Ser	Ser	Glu	Ser	Asn	325	330	335
Glu	Glu	Thr	Glu	Gly	Ser	Thr	Tyr	Thr	Ala	Gln	Gln	Pro	Tyr	Glu	Ala	340	345	350
Tyr	Asp	Gly	Cys	Tyr	Tyr	Glu	Ser	Ser	Ser	Tyr	Leu	Asp	Ser	Ser	Asn	355	360	365
Phe	Val	Asn	Asn	Glu	Gln	Leu	Lys	Tyr	Asn	Val	Pro	Asp	Tyr	Ala	Ala	370	375	380
Ile	Leu	Leu	His	Thr	Gln	Pro	His	Val	Asp	Lys	Lys	Gln	Asn	Ala	Met	385	390	395

Ser	Ala	Gln	Lys	Leu	Leu	Gln	Asp	Leu	Ala	Gln	Gln	Leu	Gln	Asn	Pro	405	410	415
Ser	Thr	Met	Pro	Gln	Asn	Glu	Phe	Leu	Thr	Lys	Phe	Asn	Ile	Leu	Val	420	425	430
Arg	Leu	Ile	Ser	Thr	Met	Thr	Thr	Asp	Gln	Leu	Ala	Gln	Phe	Ser	Arg	435	440	445
Gly	Ile	Glu	Val	Gly	Lys	Ala	Ser	Asn	Lys	Ile	Ala	Lys	Val	Asp	Met	450	455	460
Trp	Phe	Ile	Phe	Arg	Asp	Ala	Val	Ile	Gln	Ala	Gly	Thr	Gln	Pro	Ala	465	470	475
Phe	Gln	Leu	Ile	Glu	Thr	Trp	Ile	Lys	Thr	Lys	Lys	Ile	Gln	Gly	Phe	485	490	495
Leu	Ala	Ala	Glu	Val	Ile	Ser	Ser	Leu	Ala	Lys	Thr	Leu	Arg	His	Leu	500	505	510
Thr	Lys	Asp	Thr	Met	Lys	Gln	Phe	Phe	Glu	Leu	Ala	Leu	Cys	Pro	Glu	515	520	525
Val	Leu	Glu	Gln	Lys	Tyr	Leu	Asn	Ser	Ser	Ala	Leu	Ile	Ala	Ala	Ala	530	535	540
Glu	Phe	Ile	Arg	Leu	Gly	Ser	Ile	Asp	Tyr	Glu	His	Ser	Tyr	Pro	Tyr	545	550	555
Tyr	Pro	Pro	Tyr	Val	His	Gly	Arg	Phe	Pro	Leu	Lys	Asn	Asp	Arg	Phe	565	570	575
Ile	Ile	Glu	Asn	Ile	Leu	Pro	Arg	Leu	Ser	Gln	Leu	Leu	Lys	Gln	Ala	580	585	590
Val	Glu	Gln	Glu	Asp	Tyr	Gly	Lys	Thr	Leu	Val	Ile	Val	Lys	Ala	Ile	595	600	605
Gly	Thr	Leu	Gly	His	Arg	Glu	Ile	Leu	Lys	Val	Phe	Thr	Pro	Tyr	Leu	610	615	620
Glu	Gly	Gln	Ile	Lys	Val	Ser	Thr	Tyr	Leu	Arg	Val	Gln	Met	Ile	Leu	625	630	635
Ala	Leu	Lys	Pro	Leu	Ala	Glu	Gln	Lys	Asp	Arg	Tyr	Val	Arg	Ser	Ala	645	650	655
Leu	Phe	Ser	Ile	Leu	Met	Asn	Thr	Ala	Glu	Pro	Tyr	Glu	Val	Arg	Val	660	665	670
Ala	Ala	Ala	Met	Ile	Leu	Phe	Leu	Asn	Glu	Pro	Thr	Thr	Asp	Met	Leu	675	680	685
Arg	Val	Met	Ala	Gln	Leu	Thr	Asn	Asp	Asp	Pro	Ser	Ile	His	Val	Arg	690	695	700
Ala	Val	Leu	Lys	Ser	Ser	Ile	Glu	Thr	Ala	Ala	Thr	Leu	Glu	Gly	Pro	705	710	715

Lys	Tyr	Trp	His	Leu	Ala	Lys	Ala	Ala	Gln	Ser	Val	Lys	Glu	Leu	Val	725	730	735
Thr	Ser	Glu	Asp	Phe	Gly	Tyr	Ala	Tyr	Ser	Ala	Ala	Trp	Phe	Phe	Ala	740	745	750
Lys	Asn	Phe	Asp	Ser	Glu	Glu	Val	Thr	Arg	Tyr	Arg	Leu	Ala	Asn	Tyr	755	760	765
Ile	Gly	Ser	Asp	Gly	Ser	Leu	Ile	Pro	Asn	Leu	Phe	Ser	Leu	Thr	Trp	770	775	780
Asn	Asn	Arg	Phe	Tyr	Gly	Arg	Gly	Ala	Glu	Asn	Thr	Val	Gly	Phe	Thr	785	790	795
Ser	Ser	Asn	Val	Gln	Asp	Ile	Phe	Asp	Tyr	Ile	Lys	Gln	Leu	Ile	Leu	805	810	815
Gln	Pro	Arg	Lys	Ser	Thr	Thr	Glu	His	Gln	Phe	Ser	Ala	Asp	Lys	Ile	820	825	830
Ala	Lys	Leu	Leu	Asn	Ile	Lys	Gln	Asp	Pro	Leu	Gln	Pro	Ile	Glu	Ser	835	840	845
Ser	Ile	Tyr	Tyr	Lys	Ile	Phe	Asp	Lys	Glu	Phe	Phe	Trp	Pro	Leu	Asp	850	855	860
Gln	Pro	Asn	Ile	Lys	Gln	Leu	Val	Asn	Asp	Val	Phe	Gly	Phe	Val	Lys	865	870	875
Glu	Leu	Glu	Asn	Gly	Val	Gln	Ser	His	Tyr	Thr	Lys	Val	Phe	Tyr	Ser	885	890	895
Lys	Gln	Val	Ser	Val	Ile	Phe	Pro	Ile	Ala	Thr	Gly	Glu	Pro	Phe	Val	900	905	910
Phe	Glu	Tyr	Lys	Glu	Pro	Val	Val	Val	His	Leu	Gln	Thr	Lys	Leu	Ser	915	920	925
Gly	Lys	Ile	Asn	Tyr	Pro	Pro	Thr	Ser	Lys	Asp	Ile	Ser	Ser	Asn	Ile	930	935	940
Gln	Thr	Glu	Ile	Gln	Phe	Thr	Phe	Ala	Arg	Asn	Met	Glu	Gly	Ser	Val	945	950	955
Gly	Phe	Ile	Asp	Thr	Asn	Thr	Asn	Gln	Leu	Ala	Asn	Ile	Gly	Val	Val	965	970	975
Lys	Lys	Tyr	Gln	Ile	Asn	Leu	Pro	Val	Lys	Ile	Asn	Val	Ile	Gly	Gln	980	985	990
Ser	Gly	Lys	Phe	Gln	Val	Lys	Leu	Glu	Pro	Leu	His	Thr	Asp	Gln	Asp	995	1000	1005
Leu	Ile	Leu	Leu	His	His	Ser	Val	Trp	Pro	Tyr	Ser	Ala	Tyr	Gln	Gln	1010	1015	1020
Thr	Asn	Thr	Thr	Thr	Thr	Pro	Ser	His	Asp	Leu	Lys	Thr	Lys	Leu	Ile	1025	1030	1035
																		1040

Lys Arg Leu Lys Lys Val Ala Glu Met Asn Lys Glu Leu Gly Gln Gln
 1045 1050 1055

Phe Asn Leu Leu Phe Lys Tyr His Gly Phe Ser Ser Ser Asn Thr Tyr
 1060 1065 1070

Arg Asn Ala Gly Asp Phe Val Gln Asp Ala Leu Asp Phe Ser Asp Phe
 1075 1080 1085

Met Ser Leu Asn Asp Leu Ala Glu Thr His Tyr Glu Phe Thr Tyr Ser
 1090 1095 1100

Gly Lys Gln Ser Lys Thr Lys Ala Val Thr Phe Thr Ala Ala Tyr Asp
 1105 1110 1115 1120

Val Ser His Asn Leu Asn Ser Thr Gly Lys Phe Gly Glu Ala His Arg
 1125 1130 1135

Phe Ser Asp Val Thr Pro Asn Ser Ala Pro Arg Arg Glu Glu Ile Val
 1140 1145 1150

Lys Arg Val Ser Ser Gly Ile Lys Thr Ala Thr Ala Arg Val Ile Asp
 1155 1160 1165

Phe Ser Ala Ser Phe Glu Gly Leu Gln Lys Leu Glu Tyr Ala Val Thr
 1170 1175 1180

Ala Ala Val Ala Gly Ser Met Val Asp Leu Lys Thr Gln Phe Ala Val
 1185 1190 1195 1200

Phe Met Gly Ser Gln Ser Asp Asn Gly Gln Ile Asn Ala Val Phe Lys
 1205 1210 1215

Leu Gln Lys Pro Gln Met Ala Pro Leu Asp Phe His Lys Ala Leu Asn
 1220 1225 1230

Ser Ala Val Lys Tyr Leu Ile Glu Ala Asp Val Thr Tyr Gly Glu Asn
 1235 1240 1245

Ser Asn Ile Asn Phe Lys Gly His Thr Glu Arg Ser Gln Glu Tyr Ala
 1250 1255 1260

Glu Gln Leu Lys Asn Ser Leu Trp Ala Asn Gln Cys Ala Gln Glu Asn
 1265 1270 1275 1280

Ala Gln Gln Asn Lys Phe Gln Leu Gly Cys His Asn Val Leu Ile Glu
 1285 1290 1295

Ser His Ala Pro Asp Arg Phe Lys Ala Ser Ile Thr Tyr Lys His Ile
 1300 1305 1310

Pro Ala Ala His Thr Ala Leu Leu Asp Ser Tyr Ile Gln Gly Leu Trp
 1315 1320 1325

Ser Lys Gly Phe Glu Tyr Asn Pro Ser Lys Arg Leu Pro Val Gly Gln
 1330 1335 1340

Ile Glu Leu Glu Ala Asn Ala Ser Tyr Val Asp Gln Thr Ala Asn Val
 1345 1350 1355 1360

Ala Trp Thr Trp Trp Asn Gly Gln Val Arg Phe Asn Asn Leu Pro Asn
 1365 1370 1375
 Thr Tyr Ile Thr Pro Ala Leu Thr Thr Ala Tyr Gln Pro Ile Gly Ile
 1380 1385 1390
 Glu Asp Ser Trp Thr His Phe Ala Asn Ser Tyr Ser Tyr His Gln Tyr
 1395 1400 1405
 Glu Pro Phe Cys Thr Val Asp Gly Thr Lys Val Lys Thr Phe Ser Asn
 1410 1415 1420
 Arg Asp Tyr Asn Val Thr Leu Pro Glu Ile Trp Thr Val Leu Met His
 1425 1430 1435 1440
 Ala Gln Thr Asn Trp Glu Glu Leu Val Val Leu Ala Lys Arg Pro Asn
 1445 1450 1455
 Glu Ala Lys Ala Lys Arg Glu Ile Gly Lys Ile Gly Lys Leu Asp Leu
 1460 1465 1470
 Tyr Ile Ser His Lys Thr Ala Thr Gly Lys His Leu Glu Val Asn Ile
 1475 1480 1485
 Pro Tyr Ser Ala Ala Asn Asn Lys Ala Asn Val Lys Val Glu Thr Asn
 1490 1495 1500
 Ala Gln Leu Val Ala Asp Gly Asp Leu Thr Thr Tyr Trp Asp Asp Val
 1505 1510 1515 1520
 Ala Glu Thr Pro Leu Leu Gln Tyr Ser Asn His Pro Asp Arg Val Leu
 1525 1530 1535
 Leu Leu His Leu Ser Asp Gly Leu His Leu Leu Phe Asp Gly Lys Arg
 1540 1545 1550
 Gly Ile Phe Thr Thr Ser Gln Tyr Arg Asn Ile Thr Arg Gly Ile Cys
 1555 1560 1565
 Gly Gln Asn Ser Gly Asp Pro Leu Asp Asp Tyr Lys Thr Pro Leu Gly
 1570 1575 1580
 Ile Val Asp His Ser Gln His Phe Gly Ala Ala Phe Thr Leu Asp Leu
 1585 1590 1595 1600
 Glu Lys Thr Asn Ser Gln Ile Gln Gln Trp Lys Lys Ile Ala Gln Glu
 1605 1610 1615
 Thr Ala Tyr Gln Pro Lys Leu Thr His Thr Val Ile Leu Arg Phe Asp
 1620 1625 1630
 Glu Glu Trp Lys Ile Ala Gly Glu Gln Lys Gly Leu Glu Trp Gly Ser
 1635 1640 1645
 Gln Lys Val Tyr Arg Ser Arg Ser Tyr Gln Lys Gln Arg Gly Pro Cys
 1650 1655 1660
 Gln Val Gln Asn Gln Val Gln Tyr His Glu Asn His Gly Glu Ile Cys
 1665 1670 1675 1680

Ile Thr Thr Thr Pro Ile Ser Ala Cys Gln Ser His Cys His Ser Ser
1685 1690 1695

Asn Tyr Gln Val Gln Ala Val Gln Ala Val Cys Lys Gly Lys Lys Asp
1700 1705 1710

Pro Glu Phe Arg Met Tyr Lys Asp Gln Ile His Gln Gly Gln Asn Pro
1715 1720 1725

Gln Val Thr Gly Val Pro Lys Val Glu Gln Tyr Arg Val Pro Thr Thr
1730 1735 1740

Cys Thr Glu
1745

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<220>
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<400> 5
Met Trp Ser Pro Leu Leu Leu Cys Leu Leu Val Gly Ile Ala Ser Ala
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Asp Gln His Ala Trp Lys Thr Gly Gln Glu Tyr Thr Tyr Gln Val Arg
20 25 30

Gly Arg Thr Leu Ala Ala Leu His Gln Val Ala Asp Gln Tyr Thr Gly
35 40 45

Ile Ala Leu Lys Ala Gln Leu Lys Cys Gln Pro Lys Gly Ser Asp Ala
50 55 60

Leu Ser Cys Asn Ile Gln Arg Pro Gln Val Ala Glu Ile His Ala Gln
65 70 75 80

Leu Pro Gly Gly Trp Asp Ser Pro Leu Pro Glu Lys Lys Thr Asn Tyr
85 90 95

Gln Lys Phe Glu Leu Ser Glu Lys Pro Phe Glu Ile Lys Phe Lys Asn
100 105 110

Gly Val Ile Asp Asp Leu Val Val Glu Lys Ser Leu Pro Thr Trp Gln
115 120 125

Val Asn Ile Ile Lys Ser Ile Ala Ser Gln Leu Gln Val Asp Thr Gln
130 135 140

Gly Glu Asn Ala Met Lys Ser Arg Tyr Asn Gln Glu Pro Glu Gly Asp
145 150 155 160

Gln Ala Tyr Ala Thr Tyr Lys Ala Met Glu Asp Thr Val Thr Gly Glu
165 170 175

Cys Glu Val Leu Tyr Asp Ile Ser Pro Leu Pro Glu Tyr Val Leu Gln
180 185 190

Thr	Lys	Pro	Glu	Leu	Ala	Pro	Val	Pro	Gln	Leu	Lys	Gly	Ser	Gly	Gln		
		195					200					205					
Ile	Ile	Asp	Ile	Val	Lys	Thr	Ser	Asn	Phe	Ser	Asn	Cys	Glu	Gln	Arg		
	210					215					220						
Met	Gly	Tyr	His	Phe	Gly	Ile	Thr	Gly	Glu	Thr	Asp	Trp	Glu	Ala	Gly		
225					230					235					240		
Ser	Asn	Ser	Met	Gly	Asp	Phe	Leu	Ala	Lys	Ser	Ser	Val	Ser	Arg	Val		
				245					250					255			
Val	Ile	Ser	Gly	Ser	Leu	Asp	Arg	Tyr	Thr	Ile	Gln	Ser	Ser	Val	Thr		
			260					265						270			
Thr	Asn	Lys	Ile	Val	Val	Ser	Pro	Asn	Leu	Lys	Tyr	Ser	Gln	Lys	Gly		
		275					280						285				
Met	Val	Val	Ser	Arg	Leu	Asn	Ile	Thr	Leu	Asp	Ser	Val	Asn	Ala	Ala		
	290					295					300						
Ser	Gly	Ser	Pro	Arg	Ser	Pro	Ser	Glu	Pro	Glu	Ser	Thr	Gly	Asn	Leu		
305					310					315					320		
Val	Tyr	Ser	Tyr	Asn	Ser	Pro	Phe	Glu	Ala	Asn	Asn	Lys	Arg	Arg	Pro		
				325					330					335			
His	Asn	Asn	Asn	Asp	Asp	Asp	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser		
			340					345						350			
Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Glu	
		355					360						365				
Glu	Asp	Gln	Gln	Arg	Gly	Asn	Ser	Glu	Asn	Lys	Asn	Asn	Asn	Gln	His		
	370					375					380						
Gly	His	Arg	Gln	Ala	Arg	Ala	Ala	Asn	Gln	Arg	Gly	Gln	Gly	Asn	Gln		
385					390					395					400		
Asp	Ser	Asp	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser		
				405					410						415		
Ser	Ser	Asp	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Glu	Ser	Asp	Ser	Leu	Ser		
			420					425					430				
Ser	Ser	Glu	Glu	Tyr	Trp	Gln	Ser	Arg	Pro	Thr	Leu	Thr	Asp	Ala	Pro		
		435					440						445				
Glu	Ala	Pro	Met	Leu	Pro	Leu	Phe	Ile	Gly	Tyr	Lys	Gly	Ser	Ala	Ala		
	450					455					460						
Gln	Gln	Ser	Ser	Gln	Val	Asn	Pro	Val	Ser	Val	Ala	Lys	Lys	Leu	Ala		
465					470					475					480		
Ser	Gln	Ile	Gly	Glu	Glu	Leu	Gln	Lys	Pro	Ser	Asn	Ile	Pro	Lys	Gln		
				485				490						495			
Asn	Thr	Leu	Glu	Lys	Phe	Ser	His	Leu	Ala	Ala	Leu	Leu	Arg	Thr	Met		
			500					505					510				

Ser Ala Lys Gln Ile Glu Gln Ala Ala His Asp Met Tyr Ala Pro Ala
 515 520 525
 Lys Glu Asn Ala Ser Lys Ser Glu Ser Ala Lys Asn Ala Ala Trp Lys
 530 535 540
 Ala Phe Arg Asp Ala Val Ala Gln Ala Gly Thr Gly Pro Ala Phe Ser
 545 550 555 560
 Val Ile Lys Asn Trp Ile Gln Thr Asn Lys Ile Arg Asn Asn Gln Ala
 565 570 575
 Ala Asp Leu Ile Ala Val Leu Pro Ser Thr Thr Arg Tyr Pro Thr Ala
 580 585 590
 Glu Tyr Met Asp Ala Phe Phe Glu Leu Ala Thr Ser Pro Glu Val Thr
 595 600 605
 Lys Gln Ala Pro Leu Asn Asn Thr Ala Ile Leu Ala Phe Ala Asp Leu
 610 615 620
 Val Arg Glu Ser Gln Val Asn Asn Ala Ser Ala His Gly Arg Tyr Pro
 625 630 635 640
 Val His Ser Phe Gly Arg Leu Ser Pro Lys Asn Asn Pro Ala Val Gln
 645 650 655
 Gly Gln Trp Ile Pro Tyr Ile Ala Lys Gln Leu Lys Ser Ala Ile Arg
 660 665 670
 Ala Ala Asp Ser Gln Lys Ile Gln Val Tyr Ile Arg Ala Leu Gly Asn
 675 680 685
 Val Gly His Pro Lys Met Leu Ser Val Phe Glu Pro Tyr Leu Glu Gly
 690 695 700
 Gln Glu Asp Ser Ser Asp Phe Gln Arg Leu Ser Met Val Leu Ser Met
 705 710 715 720
 Gly Asn Leu Ala Arg Leu Tyr Pro Lys Gln Ala Arg Ala Val Leu Tyr
 725 730 735
 Lys Ile Tyr Gln Asn Thr Gly Glu Ala Tyr Gln Val Arg Thr Ala Ala
 740 745 750
 Val Phe Gln Leu Met Arg Thr Asn Pro Pro Pro Ser Met Leu Gln Arg
 755 760 765
 Met Ala Glu Phe Thr Asn Gln Asp Thr Ser Lys Gln Val Asn Ala Ala
 770 775 780
 Val Lys Ser Ile Ile Glu Thr Ala Ala Lys Leu Asp Asp Ala Glu Leu
 785 790 795 800
 Ala His Asn Ala Arg Ala Ala Arg Asp Leu Leu Ser Thr Lys Asn Met
 805 810 815
 Gly Leu Gln Tyr Ser Arg Gly Trp Leu His Asp Tyr Thr Ser Glu Ala
 820 825 830

Met	Ser	Ser	Gly	Tyr	Gln	Leu	Asn	Ser	Tyr	Trp	Ile	Gly	Ser	Glu	Asp	835	840	845
Ala	Ile	Ala	Pro	Gln	Ala	Val	Phe	Ala	Thr	Ala	Ala	Phe	Asn	Lys	Gly	850	855	860
Gly	Phe	Gln	Ser	Pro	Ala	Ser	Ile	Tyr	Gly	Ala	Met	Val	Ser	Ser	Val	865	870	875
Asp	Asp	Leu	Leu	Asp	Val	Leu	Tyr	Asp	Gln	Phe	Glu	Asp	Asn	Asp	Glu	885	890	895
Ala	Asn	Gln	Lys	Lys	Asn	Ser	Lys	Ser	Ser	Lys	Phe	Ser	Pro	Glu	Asn	900	905	910
Ile	Leu	Asn	Ala	Leu	Asn	Ile	Gln	Ser	Asn	Asp	Ala	Glu	Gln	Leu	Glu	915	920	925
Gly	Ser	Phe	Leu	Phe	Pro	Ala	Leu	Gln	Gly	Asn	Arg	Phe	Tyr	Ala	Phe	930	935	940
Asp	Asn	Asn	Thr	Ile	Glu	Gln	Leu	Pro	Lys	Val	Val	Lys	Gln	Ala	Ala	945	950	955
Ala	Ala	Leu	Lys	His	Gly	Gln	Ser	Phe	Asn	Tyr	Thr	Lys	Leu	Tyr	Ser	965	970	975
Asn	Glu	Glu	Leu	Thr	Val	Ser	Phe	Pro	Thr	Ala	Met	Gly	Leu	Pro	Phe	980	985	990
Val	Tyr	Thr	Met	Arg	Thr	Pro	Ser	Leu	Val	Gln	Val	Gly	Gly	Glu	Ile	995	1000	1005
Gln	Ala	Arg	Thr	Tyr	Pro	Glu	Gln	Tyr	Ser	Gly	Ser	Asn	Glu	Glu	Ile	1010	1015	1020
Ser	Ile	Pro	Glu	Ala	Val	Asn	Ala	Ser	Leu	Asp	Ile	His	Ala	Val	Tyr	1025	1030	1035
Ser	Ser	Lys	Val	Ile	Ala	Arg	Ile	Gly	Phe	Val	Asn	Pro	Ala	Asn	His	1045	1050	1055
Gln	His	His	Met	Ala	Gly	Tyr	Asp	Lys	Asn	Phe	Gln	Val	Asn	Leu	Pro	1060	1065	1070
Leu	Ser	Ala	Glu	Met	Asp	Ile	Asp	Leu	Glu	Asn	Ser	His	Val	Arg	Val	1075	1080	1085
Lys	Leu	Glu	Pro	Ile	Gln	Gln	Asn	Lys	Glu	Tyr	Asn	Leu	Phe	His	Tyr	1090	1095	1100
Ser	Ser	Trp	Pro	Tyr	Thr	Ala	Gln	Lys	Asp	Ile	Leu	Ser	Glu	Lys	Pro	1105	1110	1115
Val	Ser	Gln	Gln	Lys	Gly	Tyr	Ala	Leu	Ile	Ser	Glu	Arg	Gly	Ser	Glu	1125	1130	1135
Gln	Asn	Glu	Trp	Ala	Phe	Gly	Gln	Lys	Ser	Thr	Gly	Leu	Ala	Leu	Arg	1140	1145	1150

Phe Thr Ser Glu Gly Glu Gln Thr Glu His Gln Leu Arg Asn Trp Ala
1155 1160 1165
Trp Glu Met Leu Gln Ser Glu Asp Pro Leu Ala Ile Ala Phe Ser Leu
1170 1175 1180
Asp Asp Glu Ile Gln His Ser Asn Tyr Asn Leu Trp Leu Asp Gly Gln
1185 1190 1195 1200
His Ser Ser Asn Glu Ala Val Val Leu Thr Ala Ser Tyr Ala Asn Tyr
1205 1210 1215
Thr Lys Gly Met Gly Gly Asp Ser Asp Ser Gln Ser Gly Tyr Gln His
1220 1225 1230
Pro Ala Gly Arg Lys Asn Ser Gly Gly Glu Asp Asn Gln Ser Ser Ser
1235 1240 1245
Thr Phe Val Pro Ala Phe Gln Pro Ser Ser Gln Lys Pro Asp Ser Glu
1250 1255 1260
Ser Arg Gln Gln Glu Leu Leu Gln Lys Ala Ala Ser Gly Ile Lys Asp
1265 1270 1275 1280
Ala Tyr Ser Gln Ser Ile Asp Phe Gly Ala Val Phe Gln Gly Lys Asn
1285 1290 1295
Lys Ala Glu Tyr Ala Ala Thr Phe Ala Met Ala Asn Ser Pro Val Asp
1300 1305 1310
Pro Lys Ser Arg Val Val Phe Tyr Tyr Gly Ser Asn Pro Ala Gln Gln
1315 1320 1325
Lys Asn Tyr Gln Ile Cys Leu Ser Ala Gln Ser Ser Arg Pro Lys Val
1330 1335 1340
Pro Val Met Asp Phe Ile Lys Ala Leu Lys Ala Asp Pro Thr Thr Lys
1345 1350 1355 1360
Phe Ala Ala Asp Leu Lys Phe Gly Glu Gln Cys Gln Ser Gly Ala Gln
1365 1370 1375
Val Gln Ile Gln Gly Gln Leu Glu Gln Thr Glu Gly Arg Arg Glu Tyr
1380 1385 1390
Leu Arg Arg Thr Pro Thr Gly Gln Gln Cys Ala Gln Gln Met Gln Glu
1395 1400 1405
Gly Asn Lys Ile Leu Pro Ala Cys Arg Asn Val Thr Ala Arg Ala Asn
1410 1415 1420
Phe Leu Asn Glu Gly Ser Leu Thr Val Lys Phe Ser His Val Thr Asp
1425 1430 1435 1440
Tyr Met Lys Asn Val Ser Ala Arg Ala Tyr Gly Leu Ala Arg Tyr Phe
1445 1450 1455
Gly Tyr His Ser Ala Tyr Glu Asn Ile Val Asn Pro Gly Asn Gln Lys
1460 1465 1470

Asn Gly Gln Ile Asp Phe Gly Tyr Glu Ile Ser Pro Asp Phe Gln Arg
 1475 1480 1485
 Leu Asn Val Ser Met Ser Ala Pro Gly Leu Asp Ala Asn Ile Thr Asp
 1490 1495 1500
 Leu Glu Ile His Pro Trp Ala Arg Ser Ile Val Ala Val Asp Pro Val
 1505 1510 1515 1520
 Gln Ser Gly Ala Arg Arg Phe Ala Arg Glu Ala Leu Ala Gly Gln Tyr
 1525 1530 1535
 Asn Pro Thr Cys Val Ile Asp Asn Asn Gln Ala Ser Thr Phe Asp Asn
 1540 1545 1550
 Lys Thr Tyr Pro Ile Glu Leu Gly Asn Cys Trp His Val Val Met Thr
 1555 1560 1565
 Thr Ile Pro Asp Asp Glu Gln Asn Gly Asp Asp Glu Ile Pro Glu Asp
 1570 1575 1580
 Met Arg Val Ser Val Val Cys Arg Asp Ile Asn Glu His Gln Arg Glu
 1585 1590 1595 1600
 Cys Arg Leu Val Leu Gly Glu Ala Glu Ile Glu Met Tyr Pro Asn Asn
 1605 1610 1615
 Asp Gln Ala Ala Ile Lys Val Asn Gly Arg Ala Val Gln Leu Ser Gln
 1620 1625 1630
 Glu Glu Thr Tyr Arg Tyr Thr Ser Gln Asn Gly Glu Ile Gln Phe Glu
 1635 1640 1645
 Ala Tyr Leu Lys Pro Ser Gly Val Val Tyr Ile His Ser Glu Glu Tyr
 1650 1655 1660
 Gly Val Arg Ala Leu Tyr Asp Gly Glu Arg Ile Lys Leu Ile Leu Asn
 1665 1670 1675 1680
 Asn Glu Tyr Arg Asp Gln Ile Arg Gly Leu Cys Gly Thr Phe Asn Gly
 1685 1690 1695
 Glu Pro Ala Thr Asp Phe Thr Ala Pro Gln Asn Cys Ile Leu Lys Asn
 1700 1705 1710
 Pro Glu His Phe Ala Ala Ser Tyr Ala Leu Thr Lys Asp Gln Cys Glu
 1715 1720 1725
 Gly Pro Ala Lys Glu Asn Ala Arg Arg Ala Gln Gln Ala His Cys Tyr
 1730 1735 1740
 Arg Glu Ala Val Leu Phe Gly Asn Val Val Ser Asp Gln Asp Ala Gly
 1745 1750 1755 1760
 Arg Ser Lys Asn Lys Asp Ser Lys Trp Glu Asn Asn Lys Ser Arg Lys
 1765 1770 1775
 Ser Gly Ser Gly Gly Lys Lys Ser Gly Ser Cys Thr Lys Phe Ala Thr
 1780 1785 1790

Ala Thr Ile Glu Glu Asn Gly Lys Thr Cys Phe Ser Leu Arg Pro Val
 1795 1800 1805

Ala Thr Cys Ala Ala Gly Cys Lys Ala Thr Arg Lys Gln Glu Thr Thr
 1810 1815 1820

Val Lys Met His Cys Val Gln Ser Ser Ser Ser Ser Gln Gln Leu Val
 1825 1830 1835 1840

His Arg Ile Lys Gln Gly Ala Asn Pro Asp Phe Ser Gln Lys Ser His
 1845 1850 1855

Asp Lys Ser Ser Arg Ile Glu Val Pro Glu Ser Cys Val Ala Gln Gln
 1860 1865 1870

<210> 6

<211> 1807

<212> PRT

<213> Pimpla nipponica

<220>

<223> parasitoid wasp vitellogenin

<400> 6

Met Trp Cys Pro Leu Phe Leu Val Leu Leu Ala Gly Ala Ala Thr Ala
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Glu His Leu Gln Ala Trp Lys Thr Asp Thr Glu Tyr Gln Tyr Ala Val
 20 25 30

Arg Gly Arg Thr Leu Ser Ala Leu His Asp Val Ala Asp Gln Tyr Ser
 35 40 45

Gly Ile Ile Met Arg Ala Leu Leu Thr Ile Gln Pro Lys Ser Asp Gly
 50 55 60

Thr Leu Glu Ala Lys Val Thr Lys Ala Arg Tyr Ala Gln Ile His Thr
 65 70 75 80

Lys Leu Pro Gly Gly Trp Asn Ser Glu Ile Pro Asp His Lys Leu Glu
 85 90 95

Met Lys Gln Phe Pro Met Ser Glu Lys Val Phe Glu Ile Lys Met Lys
 100 105 110

His Gly Val Val Arg Asp Leu Ile Val Asp Lys Asp Val Pro Thr Trp
 115 120 125

Glu Val Asn Val Leu Lys Ser Ile Val Ser Gln Leu Gln Val Asp Thr
 130 135 140

Gln Gly Glu Asn Leu Met Ala Ser Lys Tyr Asn Gln Glu Pro Glu Asp
 145 150 155 160

Glu Gly Val Thr Ala Met Phe Lys Thr Met Glu Asp Thr Val Gly Gly
 165 170 175

Arg Cys Glu Val Leu Tyr Asp Ile Asn Pro Leu Pro Glu Phe Val Leu
 180 185 190

Gln	Lys	Arg	Pro	Glu	Leu	Val	Pro	Met	Pro	Asp	Ile	Arg	Gly	Asp	Gly		
		195					200					205					
Glu	Ile	Ile	Asp	Ile	Val	Lys	Thr	Lys	Asn	Tyr	Ser	Asn	Cys	Glu	Gln		
	210					215					220						
Arg	Ser	Gly	Tyr	His	Phe	Gly	Ile	Pro	Gly	Thr	Asn	Lys	Trp	Glu	Pro		
225					230					235					240		
Ser	Ser	Gly	Ala	Ser	Gly	Asn	Phe	Leu	Ser	Arg	Ser	Ser	Val	Ser	Arg		
				245					250					255			
Val	Ile	Val	Thr	Gly	Asn	Leu	Lys	Ser	Phe	Thr	Ile	Gln	Ser	Ser	Val		
		260						265					270				
Ser	Thr	Asn	Lys	Val	Ile	Leu	Ser	Pro	Asn	Phe	His	Glu	Asn	Arg	Lys		
		275					280					285					
Gly	Met	Val	Ser	Ser	Arg	Val	Asn	Val	Thr	Leu	Val	Lys	Ile	Gly	Ala		
	290					295						300					
Pro	Ser	Thr	Gly	Asp	Trp	Ser	Thr	Pro	Ala	Asn	Pro	Glu	Ser	Thr	Gly		
305					310					315					320		
Asn	Leu	Val	Tyr	Asn	Tyr	Asn	Asn	Pro	Phe	Ala	Gly	Val	Gly	Glu	Asp		
				325					330					335			
Arg	Arg	Ala	Ser	Arg	Pro	Gln	Asp	Asn	Arg	Asn	Ser	Glu	Glu	Lys	Val		
		340						345					350				
Arg	Ser	Leu	Tyr	Asn	Leu	Tyr	Arg	Arg	Asn	Arg	Ile	Asn	Asp	Asn	Asp		
	355						360					365					
Asp	Asp	Ser	Ser	Ala	Ser	Asp	Ser	Ser	Lys	Ser	Ala	Lys	Ser	Leu	Glu		
	370					375					380						
Ser	Asn	Glu	Glu	Gln	Leu	Tyr	Trp	Gln	Pro	Lys	Pro	Thr	Leu	Asn	Glu		
385					390					395				400			
Ala	Pro	Ala	Met	Ala	Met	Leu	Pro	Phe	Phe	Ile	Gly	Asn	His	Gly	Lys		
			405						410					415			
Ser	Ile	His	Lys	Thr	Asp	Glu	Ile	Glu	Pro	Ile	Thr	Met	Ala	Lys	Thr		
		420						425					430				
Leu	Ala	Ser	Gln	Ile	Gly	Ser	Asp	Phe	Gln	Asp	Pro	Asn	Ser	Ile	Thr		
	435						440					445					
Asp	Glu	Gln	Thr	Leu	Glu	Lys	Phe	Thr	Leu	Leu	Val	Arg	Ile	Ile	Arg		
	450					455					460						
Thr	Met	Ser	Thr	Gln	Gln	Ile	Ala	Glu	Ala	Glu	Arg	Asp	Leu	Tyr	Gln		
465					470					475				480			
Ser	Asn	Asn	Glu	Ile	Asp	Pro	His	Asp	Glu	Ser	Gln	Ser	Val	Arg	Arg		
			485					490						495			
Gly	Thr	Trp	Ala	Ala	Phe	Arg	Asp	Ala	Val	Ala	Gln	Ala	Gly	Thr	Ala		
			500					505					510				

Pro Ala Leu Val Thr Ile Thr Leu Trp Ile Lys Gln Lys Lys Ile Arg
 515 520 525
 Gly Val Glu Ala Ala Ser Val Val Gly Val Leu Ala Lys Thr Ala Arg
 530 535 540
 Thr Pro Thr Arg Glu Tyr Ile Asp Val Phe Phe Glu Leu Ala Thr Met
 545 550 555 560
 Pro Glu Thr Ile His Glu Pro Phe Leu Asn Thr Thr Ala Leu Phe Thr
 565 570 575
 Phe Ser Glu Leu Val Arg Tyr Ser Gln Met Asp Asn Pro Ser Ser His
 580 585 590
 Thr Arg Tyr Pro Val His Thr Phe Gly Arg Phe Ser Asp Lys Ile Asn
 595 600 605
 Pro Glu Val Phe Arg Met Tyr Val Pro Tyr Leu Ala Glu Lys Leu Lys
 610 615 620
 Thr Ser Ile Glu Lys Asn Glu Asn Ala Lys Ala His Thr Tyr Ile Val
 625 630 635 640
 Ser Leu Gly Asn Ile Ala His Pro Lys Ile Leu Ala Val Phe Glu Pro
 645 650 655
 Tyr Leu Glu Gly Lys Met Pro Ala Ser Thr Phe Gln Arg Leu Leu Met
 660 665 670
 Val Ile Ser Leu Asn Lys Leu Ala Thr Leu Lys Pro Lys Leu Ala Arg
 675 680 685
 Gly Val Phe Tyr Arg Ile Tyr Lys Asn Thr Gly Glu Ala His Gln Leu
 690 695 700
 Arg Cys Ala Ala Val Thr Ala Leu Met Ser Thr Asn Pro Pro Ala Ser
 705 710 715 720
 Met Leu Gln Arg Met Ala Glu Phe Thr Asn Glu Asp His Ser Lys His
 725 730 735
 Val Asn Ala Ala Val Lys Ser Ala Ile Glu Ser Ala Ser Glu Leu Glu
 740 745 750
 Thr Pro Gln Trp Gln Glu Leu Ala Glu Asn Ala Arg Asn Ala Lys Pro
 755 760 765
 Leu Leu Asn Lys Glu Ser Tyr Gly Phe Glu Tyr Ser Lys Leu Tyr Leu
 770 775 780
 Thr Asp Phe Ile Glu Arg Glu Met Asn Val Ala Tyr Gln Ala Gln Ala
 785 790 795 800
 Ser Phe Ile Ser Ser Asp Asp Ser Tyr Val Pro Glu Ala Leu Phe Val
 805 810 815
 Lys Ala Arg Ala Ile Phe Gly Gly Phe Thr Phe Pro Arg Thr Ser Ala
 820 825 830

Gly Ala Met Val Ser Ser Ala Lys Asp Leu Leu Ser Ala Phe Glu Asp
 835 840 845
 Ala Phe Lys Gly Glu Lys Thr Ser His Lys His Ser His Val Glu Phe
 850 855 860
 Ser Pro Glu Asn Val Ala Lys Leu Leu Lys Ile Lys Ser Glu Pro Asn
 865 870 875 880
 Glu Asp Val Glu Gly Ala Phe Met Leu Gln Ser Ala Tyr Asn Asn Lys
 885 890 895
 Phe Met Ser Leu Asp Lys Asn Thr Leu Lys Asn Leu Pro Glu Leu Ser
 900 905 910
 Ser Lys Ala Leu Lys Ala Leu Lys Asp Gly His His Phe Asn Thr Ala
 915 920 925
 Arg Ile Glu Ser Tyr Glu Met Thr Met Ser Phe Pro Met Glu Ser Gly
 930 935 940
 Phe Pro Phe Val Tyr Thr Met Lys Val Pro Ser Met Leu Lys Leu Ala
 945 950 955 960
 Gly Ser Val Lys Gly Asp Ser Asn Glu Asp Ser Leu Asp Gly His Val
 965 970 975
 His Leu Arg Ala Val Tyr Ser Val Gln Phe Gln Ser Lys Leu Gly Phe
 980 985 990
 Val Thr Pro Phe Glu His Gln His Tyr Met Ala Gly Ile Asn Lys Asn
 995 1000 1005
 Tyr Gln Ala Tyr Val Pro Leu Arg Val Asn Val Asn Tyr Glu Asp Ser
 1010 1015 1020
 Asp Lys Arg Val Thr Leu Lys Ile Gln Pro Ile Glu Gln Asn Glu Lys
 1025 1030 1035 1040
 Phe Lys Leu Trp His His Ser Val Val Pro Phe Thr Ser Arg His Asp
 1045 1050 1055
 Ile Leu Lys Met Ser Pro Val Leu Lys Asp Lys Glu Thr Gln Lys Ile
 1060 1065 1070
 Ile Thr Glu Glu Val Ser Lys Asn Glu Tyr Asn Phe Gly Ser Asp Lys
 1075 1080 1085
 His Gly Val Lys Phe Thr Val Leu Ala Glu Ala Asp Asn Asp Asn Ser
 1090 1095 1100
 Pro Leu Asn Phe Glu Asp Ala Lys Trp Glu Arg Asn Pro Leu Thr Gln
 1105 1110 1115 1120
 Leu Phe His Leu Phe Val Glu Gln Pro Val Tyr His Lys Val Asp Ile
 1125 1130 1135
 Phe Met Gln Pro Ser Lys Ser Ser Glu Gln Ser Ile Ile Leu Ser Thr
 1140 1145 1150

Ala Phe Glu Thr Leu Gln Asp Asp Thr Thr Lys Tyr Asp Glu Asp Arg
 1155 1160 1165
 Ser Lys His Ile Lys Ala Glu Ala Pro Lys Val Glu Asn Lys Lys Leu
 1170 1175 1180
 Asn Asp Pro Gln Arg Arg Arg Lys Leu Leu Lys Glu Ala Ala Lys Gly
 1185 1190 1195 1200
 Ile Ala Ala Ala Asp Ala Phe Ala Val Asp Ile Gly Leu Glu Tyr Pro
 1205 1210 1215
 Gly Gln Ala Pro Val Gln Ala Phe Ala Thr Leu Ala Phe Ala Ser Ser
 1220 1225 1230
 Glu Val Asp Glu Lys Ser Arg Gly Leu Val Tyr Trp Arg Leu Thr Asp
 1235 1240 1245
 Ala Gly Asn Asp Phe Glu Phe Glu Ser Cys Thr Ser Leu Glu Ala Arg
 1250 1255 1260
 Ser Pro Arg Thr Ser Asp Phe Gly Lys Asp Met Leu Asp Gln Pro Glu
 1265 1270 1275 1280
 Phe Arg Ser Arg Lys Phe Asp Ile Asp Leu Arg Tyr Gly Gln Thr Cys
 1285 1290 1295
 Glu Lys Gly Tyr Lys Val Glu Ile Gln Gly Ser Gln Glu Gln Thr Glu
 1300 1305 1310
 Lys Tyr Arg Asp Thr Ile Lys Arg Leu Pro Thr Ala Ile Glu Cys Ile
 1315 1320 1325
 Arg Ala Ala Lys Lys Gly Met Lys Ser Leu Pro Ala Cys His Asp Val
 1330 1335 1340
 Ser Val Lys Met Thr Met Leu Asp Lys Thr Arg Ile Thr Ile Lys Tyr
 1345 1350 1355 1360
 Asp Lys Asp Ser Arg Glu Met Tyr Gln Leu Phe Asp Asp Tyr Leu Asp
 1365 1370 1375
 Ser Met Ser Asp Ala Asp Asp Asp Leu Lys Ser Ser Lys Lys Arg Leu
 1380 1385 1390
 Asn Ala Val Lys Asp Asp Asp Lys Ala Tyr Asp Asp Thr Val Lys Ile
 1395 1400 1405
 Ala Val Asp Leu Ser Pro Asn Asp Asn Asn Gly Arg Phe Ser Tyr Glu
 1410 1415 1420
 Ser Asp Phe Val Lys Leu Glu Ala Arg Asp Val Pro Ile Asn Gly Ile
 1425 1430 1435 1440
 Gly Pro Leu Val Asn Val His Pro Asp Leu Glu Thr Ala Glu Arg Leu
 1445 1450 1455
 Asp Met Asp Met Ser Asp Glu Pro Val Arg Gln Arg Ile Cys Val Leu
 1460 1465 1470

Asp Ser His Ser Ala Thr Thr Phe Asp Glu Ser Thr Tyr Pro Ile Asn
 1475 1480 1485
 Leu Gly Lys Cys Trp His Val Val Met Thr Thr Phe Pro Lys Thr Asn
 1490 1495 1500
 Lys Asn Ser Gly Ser Ala Glu Pro Ile Asp Glu Asp Met Ala Leu Ser
 1505 1510 1515 1520
 Ile Leu Val Arg Asp Ala Gly Asp Lys Lys Lys Asp Ile Lys Val Thr
 1525 1530 1535
 Leu Gly Asp Lys Glu Leu Gln Phe Ser His Ala Asp Ser Lys Asn Lys
 1540 1545 1550
 Val Thr Leu Asp Gly Lys Lys Val Asp Leu Ser Glu Lys Arg Ser Tyr
 1555 1560 1565
 Arg His Lys Asn Gly Lys Asp Ile Asp Phe Glu Val Leu Gln Arg Pro
 1570 1575 1580
 Asp Gly Thr Leu Gly Leu Val Ser Ser Lys Tyr Asp Ile Asp Ala Trp
 1585 1590 1595 1600
 Tyr Asp Gly Gln Arg Val Gln Ile Lys Ala Ser Gly Lys Tyr Arg Ser
 1605 1610 1615
 Asp Ile Arg Gly Leu Cys Gly Asn Phe Asp Gly Glu Pro Asp Asn Asp
 1620 1625 1630
 Phe Thr Ser Pro Lys Asp Cys Val Leu Leu Lys Pro Glu Glu Phe Ala
 1635 1640 1645
 Ala Ser Tyr Ala Leu Thr Thr Lys Asp Cys His Gly Ser Ala Leu Glu
 1650 1655 1660
 His Ala Arg Lys Ala Ser Gln Ala Val Cys Ser Gln Lys Ser Pro Arg
 1665 1670 1675 1680
 Pro Gly Asn Val Val Ser Asp Arg Asp Ala Gly Arg Lys Tyr Ser Glu
 1685 1690 1695
 Asn Ser Asn Trp Gly Tyr His Ser Arg Gln Asn Ser Asp Asp Glu Gln
 1700 1705 1710
 Gly Lys Asn Asp Ser Ser Asp His Lys Arg Cys Asn Thr Leu Arg Thr
 1715 1720 1725
 Lys Val Ile Glu Glu Glu Asp Gln Ile Cys Phe Ser Leu Arg Pro Leu
 1730 1735 1740
 Pro Thr Cys Ala Glu Gly Cys Thr Ala Asn Arg Thr Lys Pro Lys Val
 1745 1750 1755 1760
 Met Pro Met His Cys Met Pro Lys Asn Ile Ala Ala Glu Arg Met Ala
 1765 1770 1775

Asp Arg Ile Lys Gln Gly Ala Asn Pro Asp Phe Ser Gln Lys Ser Tyr
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Thr Lys Lys Asn Gly Phe Asp Ile Pro Val Gly Cys His Ala Ala
1795 1800 1805

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<212> PRT

<213> Riptortus clavatus

<220>

<223> bean bug vitellogenin, bean bug yolk protein

<400> 7

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Asp Asn Pro Trp Lys Ala Gly Thr Lys Tyr Thr Tyr Gln Ile Gln Gly
20 25 30

Arg Thr Leu Thr Gly Leu His Gln Val Ala Asp Gln Tyr Thr Gly Val
35 40 45

Met Ile Gln Gly Gln Leu Thr Val Arg Ala Glu Ser Asp Asn Lys Ala
50 55 60

Thr Ala Val Ile Glu Asn Ala Lys Tyr Ala Asp Leu Gln Ala Asn Leu
65 70 75 80

Ser Arg Gly Trp Asp Ser Glu Ile Gln Glu Asn Glu Leu Gln Tyr Asn
85 90 95

Glu Leu Pro Ile Ser Lys Asp Pro Phe Glu Ile His Phe Arg Asn Gly
100 105 110

Val Ile Glu Lys Met Val Val Asn Lys Asp Ile Pro Gln Trp Gln Leu
115 120 125

Asn Phe Tyr Lys Ser Ile Ala Ser Gln Phe Gln Val Asp Thr Gln Gly
130 135 140

Lys Asn Leu Lys Asp Ser Lys Ile Asn Leu Val Pro Ser Gly Gln Ser
145 150 155 160

Gly Glu Pro Met Gly Val Tyr Lys Thr Met Glu Asp Ser Val Asn Gly
165 170 175

Ile Tyr Glu Thr Leu Tyr Asp Ile Ser Val Leu Pro Glu Tyr Ile Leu
180 185 190

Gln Ala Arg Pro Glu Leu Ala Pro Leu Pro His Leu Lys Gly Asp Gly
195 200 205

Glu Phe Ile Glu Val Val Lys Thr Arg Asn Phe Ser Asn Ser Asn Gln
210 215 220

His Val Ile Tyr Arg Phe Gly Ser Ser Gly His Glu Gly Trp Glu Ala
225 230 235 240

Gly	Thr	Asn	Gln	Met	Gly	Asp	Phe	Leu	Ser	Arg	Ser	Ser	Gln	Ser	Arg	
				245					250					255		
Val	Ile	Leu	Ser	Gly	Lys	Leu	Asn	Arg	Tyr	Thr	Ile	Gln	Ser	Ala	Val	
			260					265					270			
Thr	Thr	Glu	Lys	Val	Leu	Val	Ala	Pro	His	Val	Tyr	Asn	Asn	Gln	Lys	
		275					280					285				
Gly	Ile	Val	Val	Ser	Ser	Met	Asn	Ile	Thr	Leu	Gln	Gln	Ala	Thr	Gly	
	290					295					300					
Ser	Gln	Gly	Ser	Pro	Gln	Ser	Val	Ser	Asn	Pro	Arg	Glu	Val	Lys	Ser	
305					310					315					320	
Leu	Val	Tyr	Glu	Tyr	Glu	Ser	Gln	Gly	Asn	Ser	Glu	Asn	Leu	Gln	Ser	
				325					330					335		
Ser	Gln	Gln	Ser	Ser	Gln	Gln	Ser	Ser	Ser	Glu	Glu	Ser	Ser	Ser	Ser	
			340					345					350			
Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Glu	Glu	Asn	Met	Asn	Ser	Met	
		355						360				365				
Lys	Thr	Asn	Gln	Gln	Met	Lys	Glu	Asp	Arg	Ala	Lys	Arg	Ile	Arg	Arg	
	370					375					380					
Ser	Leu	Glu	Glu	Gln	Gln	Ser	Ser	Ile	Asn	Arg	Lys	Gly	Lys	Asn	Ala	
385					390					395					400	
Arg	Ser	Gln	Ala	Asp	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	
				405					410						415	
Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Asp	Ser	Ser	Ser	Ser	Val	Ser
			420						425					430		
Ser	Ser	Glu	Glu	Asn	Leu	Pro	Arg	Gln	Pro	Arg	Ser	Ile	Glu	Gln	Ala	
		435					440					445				
Pro	Gly	Ser	Glu	Leu	Gln	Ala	Gly	Tyr	Tyr	Met	Gly	Ser	Met	Gly	Gln	
	450					455					460					
Gln	Lys	Gln	Asn	Val	Pro	Glu	Gln	Ile	Lys	Ser	Leu	Ala	Lys	Lys	Val	
465					470					475					480	
Gly	Gln	Trp	Val	Gln	Asn	Pro	Gly	Gln	Ile	Pro	Glu	Glu	Asn	Arg	Leu	
				485					490					495		
Pro	Leu	Phe	Ser	Met	Leu	Thr	Arg	Met	Val	Gln	Asn	Ala	Asn	Ser	Gln	
			500					505					510			
Gln	Leu	Glu	Gln	Val	Thr	Gln	Ser	Leu	Tyr	His	Gln	Gln	Ser	Lys	Asn	
		515					520					525				
Gln	Gln	Gln	Ser	Asp	Ala	Glu	Arg	Gln	Gln	Tyr	Gln	Ser	Trp	Ala	Ala	
	530					535					540					
Phe	Arg	Asp	Ala	Val	Ala	Gln	Ala	Gly	Thr	Gly	Pro	Ala	Leu	Val	Thr	
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Ile	Lys	Gln	Trp	Ile	Gln	Ser	Lys	Lys	Val	Gln	Gly	Glu	Glu	Ala	Ala	
				565					570					575		
Gln	Leu	Leu	Ala	Val	Leu	Pro	Tyr	Thr	Ala	Arg	Tyr	Pro	Asn	Thr	Glu	
			580					585					590			
Tyr	Met	Asn	Tyr	Phe	Phe	Asp	Met	Val	Thr	Ser	Glu	Glu	Ile	Gln	Arg	
		595					600					605				
Gln	Arg	Ser	Leu	Asn	Thr	Thr	Ala	Leu	Phe	Ala	Phe	Thr	Glu	Leu	Ser	
	610					615					620					
Arg	Lys	Ser	Gln	Val	Asp	Tyr	Asp	Val	Ala	His	Asn	Arg	Tyr	Pro	Val	
625					630					635					640	
His	Leu	His	Ala	Lys	Asn	Ser	Gln	Glu	His	Arg	Gln	Ala	Val	Pro	Gln	
				645					650					655		
Lys	Tyr	Ile	Pro	Trp	Leu	Gln	Glu	Arg	Leu	Glu	Arg	Ala	Val	Ser	Arg	
			660					665					670			
Gly	Asp	Ser	Ile	Lys	Ala	Gln	Val	Tyr	Ile	Arg	Ala	Leu	Gly	Asn	Thr	
		675					680					685				
Ala	His	Pro	Lys	Ile	Leu	Ala	Val	Phe	Glu	Pro	Tyr	Leu	Glu	Gly	Lys	
	690					695					700					
Ser	Gln	Ile	Ser	Glu	Phe	Gln	Arg	Leu	Ser	Ile	Ile	Ala	Ser	Leu	Asp	
705					710					715					720	
Glu	Met	Thr	Arg	Thr	His	Pro	Asn	Leu	Ala	Arg	Asp	Val	Leu	Tyr	Arg	
				725					730					735		
Ile	Tyr	Gln	Asn	Thr	Ala	Glu	Lys	Ser	Glu	Ile	Arg	Ala	Ala	Ala	Val	
			740					745					750			
Arg	Gln	Leu	Met	Arg	Thr	Asn	Pro	Pro	Ala	Gln	Met	Leu	Gln	Arg	Met	
		755					760					765				
Ala	Asp	Phe	Thr	Asn	Tyr	Asp	His	Ser	His	Gln	Val	Asn	Ala	Ala	Val	
	770					775					780					
Lys	Ser	Ala	Ile	Glu	Ser	Ala	Ala	Ala	Cys	Thr	Asp	Ser	Ser	Val	Asp	
785					790					795					800	
Gln	Gln	Leu	Val	Asn	Asn	Ala	Arg	Ala	Ala	Ala	Asn	Tyr	Leu	Thr	Pro	
				805					810					815		
Lys	Asn	Tyr	Gly	Val	Gln	Tyr	Ser	Lys	Thr	His	Leu	Lys	Ser	His	Asn	
			820					825					830			
Val	Glu	Gly	Gln	Asn	Leu	Gln	Tyr	Gln	Gln	His	Cys	Ser	Ser	Ile	Gln	
		835					840					845				
Ser	Gln	Asp	Ser	Ser	Leu	Pro	Ser	Ser	Leu	Met	Tyr	Glu	Val	Gln	Gln	
	850					855					860					
Ser	Val	Gly	Gly	Tyr	His	Arg	Asp	Pro	His	Lys	Phe	Tyr	Phe	Met	Thr	
865					870					875					880	

Ser Ser Ser Glu Gln Ala Ile Asn Leu Met Arg Gln Thr Ile Ala Gln
 885 890 895
 Gln Ser Gly Ser Tyr Arg Lys Arg Trp Ser Arg Asn Gln His Gly Ser
 900 905 910
 Glu Gln Ser Tyr Glu Asn Ile Leu Arg Ser Ile His Leu His Thr Asp
 915 920 925
 Glu Pro Val Gln Val Glu Gly Asn Ile Leu Val Ser Gly Leu Gly Gly
 930 935 940
 Lys Glu Phe Phe Thr Phe Asp Asn His Thr Ile Glu Gln Ile Pro Gln
 945 950 955 960
 Phe Phe Ser Asn Ile Asn Glu Lys Leu Gln Asp Lys Ser Tyr Val Gln
 965 970 975
 His Thr Lys Tyr Tyr Asn Gln Tyr Ser Leu Glu Ile Gly Phe Pro Ser
 980 985 990
 Ala Met Gly Leu Pro Phe Val Tyr His Leu Asp Val Pro Thr Leu Ala
 995 1000 1005
 Ser Val Ser Gly Lys Trp Ser Gly Gln Val Glu Leu Gln Gln His Gln
 1010 1015 1020
 Lys Glu Gln Asn Glu Lys Tyr Ser Ile Pro Val Lys Gly Gln Val His
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 Gly Asp Phe Glu Phe Val Tyr Ser Ala Gln Lys Ser Gly Leu Met Gly
 1045 1050 1055
 Phe Val Ala Pro Phe Ser Gln Asn Arg Tyr Ile Ala Gly Leu Glu Lys
 1060 1065 1070
 Asn Ile His Ala Tyr Val Pro Val Gln Ala Lys Val Glu Tyr Asn Pro
 1075 1080 1085
 Glu Glu Asn Lys Val Gln Ala Ser Leu Gln Pro Leu Ala Gln Gln Lys
 1090 1095 1100
 Gln Glu Glu Gln Gln Val Phe Gln Tyr Ser Ser Asn Ala Tyr Thr Thr
 1105 1110 1115 1120
 Tyr Gln Lys Ser Ser Asp Leu Thr Pro Tyr Leu Gln Gly Glu Asn Thr
 1125 1130 1135
 Gln Ala Val Tyr Ala Lys Ala Pro Arg Trp Tyr His Asn Thr Tyr Gly
 1140 1145 1150
 Gln Ala Ala Thr Gly Tyr Ala Phe Asp Leu Ser Tyr Lys Thr Glu His
 1155 1160 1165
 Asn Ser His Ser Trp Ala Ser Ile Tyr Asn Ala Leu Gln Cys His Asp
 1170 1175 1180
 Tyr Ile Ser Ala Phe Leu Tyr Tyr Asp Thr Pro Gly Thr Ile Gln Asn
 1185 1190 1195 1200

Asp Tyr Ile Ser Ile Lys Tyr Asn Pro Gln Lys Ser Ser Pro Gln Glu
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 Val Asn Val Ala Leu Ser Phe Ile Ser Asn Glu Tyr Gly Asn Lys Gly
 1220 1225 1230
 Ala Arg Met Thr Ser Lys Phe Lys Lys Ala Asn Ile Arg Asp Arg Ser
 1235 1240 1245
 Ala Ser Ser Ala Arg Asp Asn Leu Ala Val Pro Ser Ser Glu Gln Gln
 1250 1255 1260
 Arg Glu Gln Glu Leu Leu Arg Asn Val Glu Ala Glu Ile Gln Asp Ala
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 Lys Ser His Leu Leu Asp Ala Ser Val Thr Phe Gly Gly Lys Asn Asn
 1285 1290 1295
 Asn Ala Gly Tyr Ser Phe Thr Leu Ala His Ala Asn Ser Pro Val Ser
 1300 1305 1310
 Glu Lys Ser Arg Val Leu Phe Tyr Tyr Asn Ala Gln Pro Val Ser Ser
 1315 1320 1325
 Ser Glu Asn Thr Lys Pro Phe Gln Ala Ala Phe Gln Leu Asp Ile Lys
 1330 1335 1340
 Asp Pro Gln Leu Pro Ala Phe Asn Tyr Gln Asp Ala Leu Asn Ala Asp
 1345 1350 1355 1360
 Ser Thr Ser Gln Val Gln Gly Lys Ile Asn Met Gly Glu Gln Leu Glu
 1365 1370 1375
 Ser Gln Ile Thr Phe Lys Gly Lys Leu Glu Arg Thr Gln Glu Arg Lys
 1380 1385 1390
 Glu Tyr Leu Gln Gln His Pro Leu Ala Arg Ala Cys Glu Ser Gln Met
 1395 1400 1405
 Gln Arg Arg Asn Tyr Ile Gln Pro Ala Cys Leu Asn Ala Thr Leu Gln
 1410 1415 1420
 Ala Asn Phe His Asn Arg Tyr Gln Phe Val Phe Asn Tyr Gln Asn Val
 1425 1430 1435 1440
 Pro Ala Gly Val Arg Arg Ala Phe His Ser Ala Tyr Ser Met Gly Arg
 1445 1450 1455
 Tyr Ala Leu Tyr Gln Asn Asn Glu Glu Asn Ile Asn Thr Glu Gln Asn
 1460 1465 1470
 Gln Glu Gly Gln Ile Gln Ile Gly Val Gln Phe Glu Glu Asn Leu Arg
 1475 1480 1485
 Ser Val Asn Leu Ser Ile Ala Ala Pro Gly Leu Ser Ser Asn Phe Ser
 1490 1495 1500
 Asn Val Arg Val Pro Gly Met Ala Val Pro Phe Val Val Tyr His Pro
 1505 1510 1515 1520

Arg Tyr Asn Thr Tyr Gln Leu Leu Lys Ser Lys Leu Tyr Gln Thr Glu
 1525 1530 1535
 Gln Pro Gln Ala Thr Ala Val Ile Asp Gly Asn Lys Ala Thr Thr Phe
 1540 1545 1550
 Ser Asn Arg Thr Tyr Pro Ile Asp Leu Gly Asn Cys Tyr His Val Phe
 1555 1560 1565
 Ala Met Tyr Ala Pro Gln Gly Gln Gly Glu Asn Arg Gln His Glu Ser
 1570 1575 1580
 Ser Ile Ser Asn Ile Gln Gln Gly Tyr Ala Val Leu Val Lys Glu Thr
 1585 1590 1595 1600
 Asp Ser Glu His Lys Glu Val Lys Val Ile Leu Gly Ser Asp Val Ile
 1605 1610 1615
 Glu Leu Lys Ser Lys Ser Ser Gly Leu Ser Ile Gln Ala Asn Gly Gln
 1620 1625 1630
 Asn Ile His Ala Ser Glu Lys Gln Leu Thr Lys Trp Ser Asn Asn Asn
 1635 1640 1645
 Asn Tyr Leu Glu Ala Tyr Ala Arg Pro Asp Ala Val Val Leu Ser Leu
 1650 1655 1660
 Pro Gln Gln Gly Ile Glu Leu Thr Tyr Asp Gly Ala Arg Val Gln Leu
 1665 1670 1675 1680
 Ser Ala Ser Ser Ser Tyr Lys Gly Asn Val Arg Gly Leu Ala Gly Thr
 1685 1690 1695
 Phe Asp Gly Gln Glu Ala Asn Asp Phe Thr Thr Pro Asn Asn Arg Val
 1700 1705 1710
 Leu Arg Asn Pro Leu Gln Phe Ala Ala Thr Tyr Ala Leu Leu Asp Ser
 1715 1720 1725
 Glu Cys Gln Gly Pro Ala Val Gln Arg Gln Gln Gln Ala Gln Gln Ser
 1730 1735 1740
 Pro Ser Tyr Glu Arg Arg Val Ile Leu Gly Asp Val Val Asn Glu Leu
 1745 1750 1755 1760
 Glu Ala Gly Arg Gln Gln Gln Gln Asn Asn Lys Ser Lys Lys Asn Lys
 1765 1770 1775
 Ala Asn Gly Ser Glu Glu Arg Met Lys Val Gln Gly Ser Ser Cys Ser
 1780 1785 1790
 Lys Leu Met Thr Gln Ile Val Glu Glu Asn Asp Lys Ser Cys Phe Ser
 1795 1800 1805
 Thr Thr Pro Gln Pro Ala Cys Ala Ser His Cys Arg Pro Thr Gly Lys
 1810 1815 1820
 Ile Gln Lys Ile Val Asp Phe His Cys Val Gln Ala Ser Ser Ser Ser
 1825 1830 1835 1840

Arg Asn Trp Ala Gln Met Ile Lys Asn Gly Ala Asn Pro Asp Phe Ser
1845 1850 1855

Ala Lys Glu Lys His Arg Gln Ile Leu Leu Gln Leu Pro Thr Gly Cys
1860 1865 1870

Val Pro Lys Ala
1875

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<212> PRT
<213> Aedes aegypti

<220>
<223> yellow fever mosquito vitellogenin

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Tyr Gln Tyr Glu Asn Ser Phe Lys Gly Tyr Asn Pro Gly Tyr Lys Gly
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Tyr Asp Ala Gly Tyr Lys Gly Tyr Gly Tyr Asp Ala Gly Tyr Lys Tyr
35 40 45

Asn Asn Gln Gly Tyr Ser Tyr Lys Asn Gly Phe Glu Tyr Gly Tyr Gln
50 55 60

Asn Ala Tyr Gln Ala Ala Phe Tyr Lys His Arg Pro Asn Val Thr Glu
65 70 75 80

Phe Glu Phe Ser Ser Trp Met Pro Asn Tyr Glu Tyr Val Tyr Asn Val
85 90 95

Thr Ser Lys Thr Met Thr Ala Leu Ala Glu Leu Asp Asp Gln Trp Thr
100 105 110

Gly Val Phe Thr Arg Ala Tyr Leu Val Ile Arg Pro Lys Ser Arg Asp
115 120 125

Tyr Val Val Ala Tyr Val Lys Gln Pro Glu Tyr Ala Val Phe Asn Glu
130 135 140

Arg Leu Pro His Gly Tyr Ala Thr Lys Phe Tyr His Asp Met Phe Lys
145 150 155 160

Phe Gln Pro Met Pro Met Ser Ser Lys Pro Phe Gly Ile Arg Tyr His
165 170 175

Lys Gly Ala Ile Lys Gly Leu Tyr Val Glu Lys Thr Ile Pro Asn Asn
180 185 190

Glu Val Asn Ile Leu Lys Ala Trp Ile Ser Gln Leu Gln Val Asp Thr
195 200 205

Arg Gly Ala Asn Leu Met His Ser Ser Lys Pro Ile His Pro Ser Lys
210 215 220

Asn	Glu	Trp	Asn	Gly	His	Tyr	Lys	Val	Met	Glu	Pro	Leu	Val	Thr	Gly	225	230	235	240
Glu	Cys	Glu	Thr	His	Tyr	Asp	Val	Asn	Leu	Ile	Pro	Ala	Tyr	Met	Ile	245	250	255	
Gln	Ala	His	Lys	Gln	Trp	Val	Pro	Gln	Gly	Gln	Leu	Arg	Gly	Glu	Asp	260	265	270	
Asp	Gln	Phe	Ile	Gln	Val	Thr	Lys	Thr	Gln	Asn	Phe	Asp	Arg	Cys	Asp	275	280	285	
Gln	Arg	Met	Gly	Tyr	His	Phe	Gly	Phe	Thr	Gly	Tyr	Ser	Asp	Phe	Arg	290	295	300	
Pro	Asn	Thr	Asn	Gln	Met	Gly	Asn	Val	Ala	Ser	Lys	Ser	Leu	Val	Ser	305	310	315	320
Tyr	Met	Tyr	Leu	Thr	Gly	Asn	Trp	Tyr	Asn	Phe	Thr	Ile	Gln	Ser	Ser	325	330	335	
Ser	Met	Ile	Asn	Lys	Val	Ala	Ile	Ala	Pro	Ser	Leu	Val	Asn	Lys	Glu	340	345	350	
Pro	Ala	Leu	Val	Tyr	Ala	Gln	Val	Asn	Met	Thr	Leu	Asn	Asp	Val	His	355	360	365	
Pro	Tyr	Asp	Lys	Val	Pro	Met	Gly	Pro	Ala	Glu	Asp	Leu	Lys	Val	Phe	370	375	380	
Val	Asp	Leu	Val	Tyr	Ser	Tyr	Asn	Met	Pro	Ser	Asp	Lys	Lys	Asn	Tyr	385	390	395	400
Val	Arg	Pro	Gly	Asn	Glu	Thr	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	405	410	415	
Ser	Ser	Ser	Ser	Ser	Ser	Glu	Ser	Ser	Ser	Ser	Ser	Ser	Glu	Ser	Val	420	425	430	
Glu	Asn	Pro	Lys	Ile	Ser	Pro	Val	Glu	Gln	Tyr	Lys	Pro	Leu	Leu	Asp	435	440	445	
Lys	Val	Glu	Lys	Arg	Gly	Asn	Arg	Tyr	Arg	Arg	Asp	Leu	Asn	Ala	Ile	450	455	460	
Lys	Glu	Lys	Lys	Tyr	Tyr	Glu	Ala	Tyr	Lys	Met	Asp	Gln	Tyr	Arg	Leu	465	470	475	480
His	Arg	Leu	Asn	Asp	Thr	Ser	Ser	Asp	Ser	Ser	Ser	Ser	Asp	Ser	Ser	485	490	495	
Ser	Ser	Ser	Ser	Ser	Glu	Ser	Lys	Glu	His	Arg	Asn	Gly	Thr	Ser	Ser	500	505	510	
Tyr	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Glu	Ser	515	520	525	
Ser	Ser	Tyr	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Glu	Ser	Tyr	Ser	Ile	530	535	540	

Ser	Ser	Glu	Glu	Tyr	Tyr	Tyr	Gln	Pro	Thr	Pro	Ala	Asn	Phe	Ser	Tyr	545	550	555	560
Ala	Pro	Glu	Ala	Pro	Phe	Leu	Pro	Phe	Phe	Thr	Gly	Tyr	Lys	Gly	Tyr	565	570		575
Asn	Ile	Phe	Tyr	Ala	Arg	Asn	Val	Asp	Ala	Ile	Arg	Ser	Val	Gly	Lys	580	585		590
Leu	Val	Glu	Glu	Ile	Ala	Ser	Asp	Leu	Glu	Asn	Pro	Ser	Asn	Leu	Pro	595	600		605
Lys	Ala	Asn	Thr	Met	Ser	Lys	Phe	Asn	Ile	Leu	Thr	Arg	Ala	Ile	Arg	610	615		620
Ala	Met	Gly	Tyr	Glu	Asp	Ile	Tyr	Glu	Leu	Ala	Gln	Lys	Tyr	Phe	Val	625	630		635
Ser	Gln	Lys	Glu	Arg	Gln	Val	Ala	Gln	Phe	Ser	Asp	Lys	Lys	Phe	Ser	645	650		655
Lys	Arg	Val	Asp	Ala	Trp	Val	Thr	Leu	Arg	Asp	Ala	Val	Ala	Glu	Ala	660	665		670
Gly	Thr	Pro	Ser	Ala	Phe	Lys	Leu	Ile	Phe	Asp	Phe	Ile	Lys	Glu	Lys	675	680		685
Lys	Leu	Arg	Gly	Tyr	Glu	Ala	Ala	Thr	Val	Ile	Ala	Ser	Leu	Ala	Gln	690	695		700
Ser	Ile	Arg	Tyr	Pro	Thr	Glu	His	Leu	Leu	His	Glu	Phe	Phe	Leu	Leu	705	710		715
Val	Thr	Ser	Asp	Val	Val	Leu	His	Gln	Glu	Tyr	Leu	Asn	Ala	Thr	Ala	725	730		735
Leu	Phe	Ala	Tyr	Ser	Asn	Phe	Val	Asn	Gln	Ala	His	Val	Ser	Asn	Arg	740	745		750
Ser	Ala	Tyr	Asn	Tyr	Tyr	Pro	Val	Phe	Ser	Phe	Gly	Arg	Leu	Ala	Asp	755	760		765
Ala	Asp	Tyr	Lys	Ile	Ile	Glu	His	Lys	Ile	Val	Pro	Trp	Phe	Ala	His	770	775		780
Gln	Leu	Arg	Glu	Ala	Val	Asn	Glu	Gly	Asp	Ser	Val	Lys	Ile	Gln	Val	785	790		795
Tyr	Ile	Arg	Ser	Leu	Gly	Asn	Leu	Gly	His	Pro	Gln	Ile	Leu	Ser	Val	805	810		815
Phe	Glu	Pro	Tyr	Leu	Glu	Gly	Thr	Ile	Gln	Ile	Thr	Asp	Phe	Gln	Arg	820	825		830
Leu	Ala	Ile	Met	Val	Ala	Leu	Asp	Asn	Leu	Val	Ile	Tyr	Tyr	Pro	Ser	835	840		845
Leu	Ala	Arg	Ser	Val	Leu	Tyr	Arg	Ala	Tyr	Gln	Asn	Thr	Ala	Asp	Val	850	855		860

His	Glu	Val	Arg	Cys	Ala	Ala	Val	His	Leu	Leu	Met	Arg	Thr	Asp	Pro	865	870	875	880
Pro	Ala	Asp	Met	Leu	Gln	Arg	Met	Ala	Glu	Phe	Thr	His	His	Asp	Pro		885	890	895
Ser	Leu	Tyr	Val	Arg	Ala	Ala	Val	Lys	Ser	Ala	Ile	Glu	Thr	Ala	Ala	900	905		910
Leu	Ala	Asp	Asp	Tyr	Asp	Glu	Asp	Ser	Lys	Leu	Ala	Leu	Asn	Ala	Lys	915	920		925
Ala	Ala	Ile	Asn	Phe	Leu	Asn	Pro	Glu	Asp	Val	Ser	Ile	Gln	Tyr	Ser	930	935		940
Phe	Asn	His	Ile	Arg	Asp	Tyr	Ala	Leu	Glu	Asn	Leu	Glu	Leu	Ser	Tyr	945	950	955	960
Arg	Leu	His	Tyr	Gly	Glu	Ile	Ala	Ser	Asn	Asp	His	Arg	Tyr	Pro	Ser		965	970	975
Gly	Leu	Phe	Tyr	His	Leu	Arg	Gln	Asn	Phe	Gly	Gly	Phe	Lys	Lys	Tyr		980	985	990
Thr	Ser	Phe	Tyr	Tyr	Leu	Val	Ser	Ser	Met	Glu	Ala	Phe	Phe	Asp	Ile	995	1000		1005
Phe	Lys	Lys	Gln	Tyr	Asn	Thr	Lys	Tyr	Phe	Ala	Asp	Tyr	Tyr	Lys	Ser	1010	1015	1020	
Ala	Asp	Tyr	Ser	Thr	Asn	Tyr	Tyr	Asn	Phe	Asp	Lys	Tyr	Ser	Lys	Tyr	1025	1030	1035	1040
Tyr	Lys	Gln	Tyr	Tyr	Tyr	Ser	Lys	Asp	Ser	Glu	Tyr	Tyr	Gln	Lys	Phe		1045	1050	1055
Tyr	Gly	Gln	Lys	Lys	Asp	Tyr	Tyr	Asn	Asp	Lys	Glu	Pro	Phe	Lys	Phe		1060	1065	1070
Thr	Ala	Pro	Arg	Ile	Ala	Lys	Leu	Leu	Asn	Ile	Asp	Ala	Glu	Glu	Ala	1075	1080		1085
Glu	Gln	Leu	Glu	Gly	Gln	Leu	Leu	Phe	Lys	Leu	Phe	Asn	Gly	Tyr	Phe	1090	1095		1100
Phe	Thr	Ala	Phe	Asp	Asn	Gln	Thr	Ile	Glu	Asn	Leu	Pro	His	Lys	Met	1105	1110	1115	1120
Arg	His	Leu	Phe	Glu	Asn	Leu	Glu	Asp	Gly	Tyr	Ala	Phe	Asp	Val	Thr		1125	1130	1135
Lys	Phe	Tyr	Gln	Gln	Gln	Asp	Val	Val	Leu	Ala	Trp	Pro	Leu	Ala	Thr	1140	1145		1150
Gly	Phe	Pro	Phe	Ile	Tyr	Thr	Leu	Lys	Ala	Pro	Thr	Val	Phe	Lys	Phe	1155	1160		1165
Glu	Val	Asp	Ala	Ser	Ala	Lys	Thr	His	Pro	Gln	Val	Tyr	Lys	Met	Pro	1170	1175		1180

Ala Gly His Pro Glu Thr Glu Asn Asp Asp Phe Phe Tyr Met Pro Gln
 1185 1190 1195 1200
 Ser Ile Asn Gly Ser Val Asp Val Asn Leu Leu Tyr His Arg Met Val
 1205 1210 1215
 Asp Ala Lys Val Gly Phe Val Thr Pro Phe Asp His Gln Arg Tyr Ile
 1220 1225 1230
 Ala Gly Tyr Gln Lys Lys Leu His Gly Tyr Leu Pro Phe Asn Val Glu
 1235 1240 1245
 Leu Gly Leu Asp Phe Val Lys Asp Glu Tyr Glu Phe Glu Phe Lys Phe
 1250 1255 1260
 Leu Glu Pro Lys Asp Asp His Leu Leu Phe His Met Ser Ser Trp Pro
 1265 1270 1275 1280
 Tyr Thr Gly Tyr Lys Asp Ile Thr Asp Met Arg Pro Ile Ala Glu Asn
 1285 1290 1295
 Pro Asn Ala Lys Ile Val His Asp Asp Asn Gln Ser Thr Lys Thr Met
 1300 1305 1310
 Glu His Thr Phe Gly Gln Asp Met Thr Gly Val Ala Leu Arg Phe His
 1315 1320 1325
 Ala Lys Tyr Asp Phe Asp Leu Ile Asn Phe Gln Gln Phe Trp Ser Leu
 1330 1335 1340
 Ile Gln Lys Asn Asp Phe Val Ser Ala Val Asn Tyr Pro Phe Ala Tyr
 1345 1350 1355 1360
 Gln Pro Tyr Glu Tyr His Gln Phe Asn Leu Phe Tyr Asp Ser Gln Arg
 1365 1370 1375
 Thr His Ala Lys Ser Phe Lys Phe Tyr Ala Tyr Gln Lys Phe Gly Ala
 1380 1385 1390
 Pro Ser Phe Glu Glu Thr Gly Pro Lys His Pro Ala Asn Arg His Ser
 1395 1400 1405
 Tyr Ser Gly Asn Tyr Tyr Glu Ser Asn Tyr Ala Gln Pro Phe Val Tyr
 1410 1415 1420
 Ser Pro Gly Ser Gln Arg Arg Tyr Glu Gln Phe Phe Arg Asn Ala Ala
 1425 1430 1435 1440
 Ser Gly Ile Arg Asn Ser Phe Val Arg Tyr Tyr Asp Phe Gly Phe Glu
 1445 1450 1455
 Phe Tyr Ala Pro Gln Tyr Lys Ser Glu Phe Thr Phe Thr Thr Ala Phe
 1460 1465 1470
 Ala Asp Ser Pro Val Asp Lys Thr Ser Arg Gln Leu Tyr Tyr Phe Tyr
 1475 1480 1485
 Ala Ser Pro Met Phe Pro Ser Gln Ser Tyr Phe Lys Asp Ile Pro Phe
 1490 1495 1500

Ser Gly Lys Gln Phe Gln Phe Cys Ala Thr Ala Thr Ser Glu Phe Pro
 1505 1510 1515 1520
 Arg Val Pro Tyr Leu Lys Phe Ser Asp Phe Asp Lys Tyr Tyr Gly Asp
 1525 1530 1535
 Ala Ser Gln Tyr Phe Asp Phe Leu Tyr Gly Glu Ser Cys Gln Gly Gly
 1540 1545 1550
 Ala His Ile Ala Val Lys Gly Lys Gln Lys Gln Thr Gly Lys Tyr Arg
 1555 1560 1565
 Glu Tyr Leu Arg Phe Ser Asp Val Ala Lys Ala Cys Lys Glu Gln Met
 1570 1575 1580
 Ala Asn Gly Tyr Tyr Gln Phe Glu Glu Cys Gln Gln Ala Ile Asp Gln
 1585 1590 1595 1600
 Ala Tyr Tyr Tyr Asp Phe Tyr Asp Tyr Ala Ile Glu Tyr Lys Asp Val
 1605 1610 1615
 Gly Ser Val Ala Lys Asn Leu Thr Asn Lys Phe Tyr Asn Tyr Phe Gln
 1620 1625 1630
 Tyr Ala Phe Tyr Pro Tyr Phe Glu Ser Asn Phe Phe Tyr His Gly Lys
 1635 1640 1645
 Ser Asn Tyr Ile Lys Ala Glu Phe Glu Phe Ala Pro Tyr Gly Asp Tyr
 1650 1655 1660
 Tyr Asn Ala Ser Phe Phe Gly Pro Ser Tyr Ala Phe Gln Val Gln Asn
 1665 1670 1675 1680
 Tyr Pro Val Phe Asn Asp Tyr Ser Thr Tyr Phe Pro Tyr Phe Phe Lys
 1685 1690 1695
 Tyr Thr Phe Phe Pro Arg Tyr Gln Pro Tyr Tyr Met His Arg Leu Pro
 1700 1705 1710
 Ser His Lys Pro Arg Asn Arg Pro Tyr Tyr Glu Leu Ser Asn Tyr Glu
 1715 1720 1725
 Gln Phe Ala Ile Phe Asp Arg Lys Pro Gln Tyr Pro Ser Cys Ser Phe
 1730 1735 1740
 Ser Asn Asp Tyr Phe Tyr Thr Phe Asp Asn Lys Lys Tyr Phe Tyr Asp
 1745 1750 1755 1760
 Met Gly Glu Cys Trp His Ala Val Met Tyr Thr Val Lys Pro Asp Tyr
 1765 1770 1775
 Asp Phe Tyr Ala Gln Gln Ser His Phe Tyr Asn Ser Asp Phe Glu Tyr
 1780 1785 1790
 Lys Tyr Lys Asn Gly Phe Glu Glu Tyr Glu Gln Phe Ala Ala Leu Ala
 1795 1800 1805
 Arg Arg Gly Ser Asp Asn Gln Leu Tyr Phe Lys Phe Leu Phe Gly Asp
 1810 1815 1820

Asn Tyr Ile Glu Val Phe Pro Asn Asn Gly Gly Val Pro Phe Val Lys
 1825 1830 1835 1840
 Tyr Asn Gly Arg Pro Tyr Asp Ile Ser Lys Ser Asn Ile Ala His Phe
 1845 1850 1855
 Glu Tyr Lys Glu Gly Tyr Pro Ser Phe Pro Phe Phe Tyr Ala Phe Ala
 1860 1865 1870
 Tyr Pro Asn Lys Asp Leu Glu Val Ser Phe Phe Gly Gly Lys Leu Lys
 1875 1880 1885
 Phe Ala Thr Asp Gly Tyr Arg Ala Arg Phe Phe Ser Asp Tyr Ser Phe
 1890 1895 1900
 Tyr Asn Asn Phe Val Gly Leu Cys Gly Thr Asn Asn Gly Glu Tyr Phe
 1905 1910 1915 1920
 Asp Glu Phe Val Thr Pro Asp Gln Cys Tyr Met Arg Lys Pro Glu Phe
 1925 1930 1935
 Phe Ala Ala Ser Tyr Ala Ile Thr Gly Gln Asn Cys Thr Gly Pro Ala
 1940 1945 1950
 Lys Ala Phe Asn Tyr Ala Tyr Gln Gln Lys Ala Lys Gln Glu Cys Val
 1955 1960 1965
 Lys Arg Glu Val Tyr Tyr Gly Asp Ile Ile Tyr Asn Gln Glu Tyr Tyr
 1970 1975 1980
 His Pro Arg Tyr Arg Tyr Tyr Asn His Asn Val Glu Glu Ser Ser Ser
 1985 1990 1995 2000
 Ser Ser Ser Ser Ser Ser Ser Asp Ser Ser Ser Ser Ser Ser Ser
 2005 2010 2015
 Glu Phe Ser Ser Leu Ser Arg Ser Gly Ser Ser Ser Ser Ser Ser
 2020 2025 2030
 Ser Glu Glu Gln Lys Glu Phe His Pro His Lys Gln Glu His Ser Met
 2035 2040 2045
 Lys Glu Cys Pro Val Gln His Gln His Gln Phe Phe Glu Gln Gly Asp
 2050 2055 2060
 Arg Ile Cys Phe Ser Leu Arg Pro Leu Pro Val Cys His Ser Lys Cys
 2065 2070 2075 2080
 Ala Ala Thr Glu Lys Ile Ser Lys Tyr Phe Asp Val His Cys Phe Glu
 2085 2090 2095
 Lys Asp Ser Thr Gln Ala Lys Lys Tyr Lys Ser Glu Ile Gly Arg Gly
 2100 2105 2110
 Tyr Thr Pro Asp Phe Lys Ser Phe Ala Pro His Lys Thr Tyr Lys Phe
 2115 2120 2125
 Asn Tyr Pro Lys Ser Cys Val Tyr Lys Ala Tyr
 2130 2135

<210> 9
 <211> 1790
 <212> PRT
 <213> *Anthonomus grandis*

<220>
 <223> boll weevil vitellogenin

<400> 9
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 Ser Ser Ser Ser Pro Ala Trp Lys Asp Asn Thr Glu Tyr Val Tyr Ser
 20 25 30
 Val Asn Gly Arg Thr Leu Thr Gly Leu Glu Glu Thr Ala Asp Gln Tyr
 35 40 45
 Ser Gly Val Phe Leu Glu Ala Lys Leu His Leu Ser Ile Arg Pro Asp
 50 55 60
 Gly Lys Leu Gln Gly Arg Ile Ser Glu Pro Lys Phe Ala Gln Ile Leu
 65 70 75 80
 Ser Gln Leu Pro Asp Gly Trp Lys Ser Glu Ile Pro Asp Ser Gln Ile
 85 90 95
 Ser Tyr Lys Gln Leu Gln Leu Ser Gln Lys Pro Phe Gln Leu Val Leu
 100 105 110
 Glu Asn Gly Leu Ile Lys Arg Leu Ile Val Glu Lys Asp Thr Leu Asn
 115 120 125
 Trp Glu Ala Asn Ile Ile Lys Ser Ile Val Ser Gln Phe Gln Met Asp
 130 135 140
 Leu Gln Gly Glu Asn Ala Leu Gln Asn Pro Thr Ser Ser Phe Pro Thr
 145 150 155 160
 Asn Glu Tyr Met Asp Ala Val Phe Lys Thr Met Glu Glu Thr Val Thr
 165 170 175
 Gly Lys Thr Glu Thr Ile Tyr Asp Ile His Arg Leu Pro Glu Tyr Leu
 180 185 190
 Val Gln Ser Gln Pro Trp Ile Ala Pro Gln Tyr Lys Leu Lys Gly Glu
 195 200 205
 Gly Asp Leu Ile Glu Val Ile Lys Ser Lys Asn Tyr Thr Asn Ala Arg
 210 215 220
 Asp Arg Pro Ser Tyr His Tyr Gly Phe Gly Glu Ile Glu Glu Ser Glu
 225 230 235 240
 Pro Thr Ala Asn Lys Met Gly Gln Phe Phe Ile Arg Gln Ser Asn Ser
 245 250 255
 Arg Ala Ile Leu Thr Gly Lys Pro Ser Arg Tyr Ile Ile Gln Ser Thr
 260 265 270

Tyr	Thr	Val	Asn	Lys	Ile	Met	Val	Asn	Pro	Ile	Leu	Lys	Asn	Lys	Glu	275	280	285
Met	Gly	Ser	Ile	Thr	Ser	Met	Val	Asn	Val	Thr	Leu	Leu	Glu	Ile	Asn	290	295	300
Asn	Gln	Gln	Gln	Gln	Pro	Glu	Glu	Leu	Ser	Asn	Pro	Leu	Asp	Ile	Gly	305	310	315
Asn	Leu	Val	Tyr	Thr	Tyr	Gly	Gln	Pro	Lys	Asn	Asn	Gln	Val	His	Ser	325	330	335
Lys	Leu	Asn	Glu	Asn	Leu	Met	Glu	Asp	Ser	Ser	Ser	Glu	Glu	Ser	Ser	340	345	350
Glu	Gln	Glu	Met	Thr	His	Arg	Arg	Phe	Arg	Arg	Ser	Ala	Asn	Ser	Leu	355	360	365
Thr	Lys	Gln	Trp	Arg	Glu	Ser	Ser	Glu	Glu	Trp	Asn	Gln	Gln	Gln	Gln	370	375	380
Gln	Pro	Arg	Pro	Gln	Leu	Thr	Arg	Ala	Pro	His	Ser	Pro	Leu	Leu	Pro	385	390	395
Ser	Met	Val	Gly	Tyr	His	Gly	Lys	Ser	Ile	Lys	Glu	Asn	Lys	Asp	Phe	405	410	415
Asp	Ile	Arg	Gln	Asn	Val	Glu	Asn	Leu	Val	Thr	Glu	Ile	Ser	Asp	Glu	420	425	430
Ile	Lys	Gln	Ser	Glu	Lys	Thr	Ile	Ser	Lys	His	Thr	Leu	Asp	Lys	Tyr	435	440	445
Thr	Ile	Leu	Asn	Thr	Leu	Val	Arg	Leu	Met	Asp	Glu	Asp	Asp	Ile	Gln	450	455	460
Phe	Val	Ala	Glu	Gln	Met	Tyr	Ser	Gln	Met	Lys	Asn	Gly	Gln	Gln	Arg	465	470	475
Tyr	Thr	Trp	Ser	Ile	Phe	Arg	Asp	Ser	Val	Ala	Glu	Ala	Gly	Thr	Gly	485	490	495
Pro	Ala	Leu	Leu	Asn	Ile	Lys	Lys	Trp	Ile	Glu	Thr	Lys	Lys	Ile	Gln	500	505	510
Lys	Thr	Glu	Ala	Ala	Gln	Val	Ile	Gly	Thr	Leu	Ala	Gln	Ser	Thr	Arg	515	520	525
Phe	Pro	Thr	Glu	Glu	Tyr	Met	Arg	Lys	Phe	Phe	Glu	Leu	Ala	Thr	Glu	530	535	540
Thr	Gln	Val	Arg	Gln	Gln	Glu	Thr	Leu	Asn	Gln	Thr	Cys	Ile	Leu	Ser	545	550	555
Tyr	Thr	Asn	Leu	Val	His	Lys	Val	Tyr	Ile	Asn	Arg	Asn	Glu	Ser	His	565	570	575
Asn	Gln	Phe	Pro	Val	His	Ala	Phe	Gly	Ser	Phe	Tyr	Thr	Lys	Lys	Gly	580	585	590

Arg	Glu	Phe	Val	Lys	Thr	Thr	Val	Ile	Pro	His	Leu	Lys	Gln	Glu	Leu	595	600	605
Glu	Lys	Ala	Ile	Ser	Asn	Ala	Asp	Asn	Asn	Lys	Ile	His	Val	Met	Ile	610	615	620
Arg	Ala	Leu	Gly	Asn	Ile	Gly	His	Lys	Ser	Ile	Leu	Asn	Val	Phe	Gln	625	630	635
Pro	Tyr	Phe	Glu	Gly	Glu	Lys	Gln	Val	Ser	Gln	Phe	Gln	Arg	Leu	Met	645	650	655
Met	Val	Ala	Cys	Met	Asp	Arg	Leu	Ala	Asp	Cys	Tyr	Pro	His	Ile	Ala	660	665	670
Arg	Ser	Val	Phe	Tyr	Lys	Ile	Tyr	Gln	Asn	Thr	Ala	Glu	Leu	Pro	Glu	675	680	685
Ile	Arg	Val	Val	Ala	Val	His	Gln	Leu	Ile	Arg	Ala	Asn	Pro	Pro	Val	690	695	700
Glu	Met	Leu	Gln	Arg	Met	Ala	Gln	Tyr	Thr	Asn	Thr	Asp	Ser	Gln	Glu	705	710	715
Glu	Val	Asn	Ala	Ala	Val	Lys	Ser	Val	Ile	Glu	Ser	Ser	Cys	Lys	Leu	725	730	735
Glu	Ser	Ser	Lys	His	Ala	Glu	Leu	Arg	Lys	Ala	Ala	Gln	Ser	Ala	Arg	740	745	750
Pro	Leu	Leu	Thr	Lys	Lys	Gln	Tyr	Gly	Met	Glu	Gln	Ser	Tyr	Ile	Asn	755	760	765
Leu	Arg	Asp	Tyr	Val	Ala	Glu	Gln	Met	Gly	Leu	Glu	Leu	His	Val	Gln	770	775	780
Arg	Thr	Ser	His	Ser	Ser	Ala	Glu	Ser	Ser	Phe	Pro	Lys	Ile	Met	Lys	785	790	795
Phe	Gln	Leu	His	Gln	His	Asn	His	Gly	Met	Lys	Gln	His	Ile	Leu	Ser	805	810	815
Thr	Gly	Gly	Met	Ile	Ser	Ser	Ile	Arg	Glu	Leu	Leu	Asn	Val	Leu	Tyr	820	825	830
Arg	Gln	Thr	Glu	Val	Phe	Gln	Gln	Glu	Lys	Ser	Gln	Arg	Ser	Gln	Glu	835	840	845
Gln	Gly	Lys	Asp	Asn	Glu	Trp	Ser	Ser	Ala	Asn	Ile	Ala	Arg	Leu	Met	850	855	860
Asn	Tyr	Glu	Arg	Asp	Glu	Arg	Glu	Gln	Leu	Glu	Ala	Ile	Ile	Tyr	Ala	865	870	875
Gln	Val	Glu	Asp	Val	Gln	Lys	Leu	Trp	Ser	Phe	Asp	Asn	Gln	Thr	Leu	885	890	895
Glu	His	Leu	Pro	Glu	Val	Ile	Arg	Gln	Gln	Glu	Glu	Ile	Tyr	Arg	Gln	900	905	910

Gly Lys Asp Phe Ser Tyr Val Lys Leu Lys Gln Leu Asn Glu Met Ala
 915 920 925
 Leu Ser Phe Pro Thr Glu Met Gly Leu Pro Phe Leu Tyr Thr Tyr Asp
 930 935 940
 Val Pro Val Leu Met Lys Val Glu Gly Lys Ile Arg Ala Leu Ala Asn
 945 950 955 960
 Pro Ala Ile Ser Arg Asn Asn Lys Leu Thr Lys Pro Glu Gln Ile Ser
 965 970 975
 Thr Glu Ile Lys Ala Arg Val Thr Cys Thr Gly Lys Thr Gln Ser His
 980 985 990
 Leu Ser Phe Val Thr Pro Phe Asp His Gln Ile Tyr Met Ala Gly Tyr
 995 1000 1005
 Asp Lys Asn Met Tyr Val Ser Ile Pro Val Asn Ala Arg Leu Glu Met
 1010 1015 1020
 Asp Val Lys Ser Lys Glu Ala Lys Ile Glu Phe Glu Val Glu Gln Gln
 1025 1030 1035 1040
 Gln Gln Asp Ser Arg Leu Val His Ile Thr Ser Thr Pro Tyr Thr Ser
 1045 1050 1055
 Arg Ser Asp Val Met Ala Ile Ser Pro Val Ala Leu Arg Pro Asn Thr
 1060 1065 1070
 Tyr Val Ile Lys Ser His Arg Asn Asn His Arg Tyr Phe Asp Phe Asn
 1075 1080 1085
 Phe Gly Lys Lys Glu Thr Gly Leu Thr Phe Arg Gly Trp Gly His His
 1090 1095 1100
 Pro Glu Gln Ser Ile Gly Phe Asn Asp Leu Val Ser Met Trp Gln Ser
 1105 1110 1115 1120
 Arg Gly Val Ala Gly Val Trp Glu Gln Leu Trp Asp Lys Cys Ser Thr
 1125 1130 1135
 Glu Tyr Ser Glu Ala Thr Ile Ser Phe Ile Pro Ser Gln Ser Thr Thr
 1140 1145 1150
 Arg Lys Ala Thr Phe Arg Ile Asn Val Asp Gln Lys Tyr Gln Lys Gln
 1155 1160 1165
 Pro Glu Thr Gln Ser Pro Glu Asp Leu Leu Thr Leu Asn Gln Leu Ser
 1170 1175 1180
 Ser Lys Leu Gln Lys Asp Glu Pro Lys Gln Arg Gln Gln Glu Ile Lys
 1185 1190 1195 1200
 Lys His Val Gly Ser Gly Ile Asn Ser Ala Leu Leu Ser Cys Ser Asp
 1205 1210 1215
 Ile Ser Leu Glu Phe Glu Gly Asp Lys Lys Tyr Glu His Val Val Gly
 1220 1225 1230

Phe Ala Val Ala Lys Ser Asn Ala Asp Pro Lys Ser Arg Val Met Phe
1235 1240 1245
Tyr Tyr Lys Asn Lys Asn Glu Asn Lys Gln Gly Ala Leu Glu Ile Arg
1250 1255 1260
Ser Glu Ile Pro Asn Thr Asn Gly Leu Asn Leu Asp Asp Ser Leu Asp
1265 1270 1275 1280
Thr Glu Pro Ser Thr Lys Tyr Asn Met Arg Leu Gln Tyr Gly Asn Ser
1285 1290 1295
Glu Asn Asp Ala Phe Glu Ile Ser Ala Gln Ala Gln Leu Ser Arg Ser
1300 1305 1310
Gln Glu Arg Lys Gln Tyr Leu Ile Asn Gln Asp Pro Leu Tyr His Val
1315 1320 1325
Cys Lys Glu Gln Met Gln Gln Lys Asn Phe Gln Leu Pro Ala Cys Gln
1330 1335 1340
Asn Met Thr Ile Lys Ala Asn Phe Leu Asp His Ile Lys Tyr Gln Val
1345 1350 1355 1360
Gln Tyr Gln Lys Leu Asn Trp Lys Leu Val Glu Thr Leu Glu Gly Met
1365 1370 1375
Phe Lys Gly Leu Arg Val Leu Tyr Tyr Pro Met Thr Glu Ile Lys Ser
1380 1385 1390
Ile Ser Ser Val Gly Gln Asn Val Val Glu Gly Glu Val Gln Phe Gln
1395 1400 1405
Pro Glu Asp Phe Arg Gln Val Asn Val Thr Val Arg Asn Thr Asp Glu
1410 1415 1420
Glu Thr Val Phe Phe Asn Ile Ser Leu Asn Asn Glu Leu Leu Arg Thr
1425 1430 1435 1440
Leu Leu Val Pro His Pro Val Phe His Ala Lys Cys Arg Phe Ala Gly
1445 1450 1455
Leu Met Gln Gly Gln Gln Asn Tyr Arg Pro Thr Cys Val Ile Asp Gln
1460 1465 1470
Thr Thr Ala Gln Thr Phe Ser Asn Lys Thr Tyr Ser Val Asn Leu Asp
1475 1480 1485
Lys Glu Pro Thr Val Val Met Gln Tyr Val Pro Lys Asp Ala Arg Val
1490 1495 1500
Asn Gly Gln Gln Ser Lys Ser Val Glu Gln Leu Leu Arg Glu Ser Ile
1505 1510 1515 1520
Glu Asn Tyr Val Val Leu Val Arg Gln Val Ala Ala Asn Gln Lys Glu
1525 1530 1535
Val Ile Ile Asn Leu Asn His Pro Arg Thr Gln Gly Lys Thr Val Lys
1540 1545 1550

Ile Glu Met Lys Pro Ser Glu Asp Arg Gln Lys Ser Ala Arg Asn Pro
 1555 1560 1565
 Ala Ala Lys Val Thr Ile Asp Gly Gln Glu Met His Phe Asp Asp Lys
 1570 1575 1580
 Gln Ile Ala Asp Lys Cys Asp Gly Tyr Val Gln Val Tyr Ala Leu Pro
 1585 1590 1595 1600
 Asn Gly Glu Val Lys Leu Glu Val Glu Asp Ala Phe Tyr Leu Ile Tyr
 1605 1610 1615
 Asp Gly Gln Arg Val Lys Val Thr Ala Thr Gly Asn Lys Leu Arg Asp
 1620 1625 1630
 Ser Val Tyr Gly Leu Cys Gly Arg Phe Ser Gln Asp Lys His Glu Asp
 1635 1640 1645
 Phe Thr Val Pro Ser Asn Cys Val Thr Arg Asp Thr Arg Lys Phe Val
 1650 1655 1660
 Glu Ser Tyr Gln Val Glu Lys Gly Gln Gln Trp Arg Asn Ser Pro Ser
 1665 1670 1675 1680
 Glu Gln Cys Ile Lys Lys Val Leu Pro Leu Tyr Thr Asn Val Ile Ser
 1685 1690 1695
 Asn Gln Asn Gly Ser Gln Met Arg Thr Lys Leu Ala Ser Gly Thr Val
 1700 1705 1710
 Met Lys His Arg Tyr Ile Glu Glu Asn Gly Glu Ile Cys Phe Thr Ile
 1715 1720 1725
 Arg Pro Leu Pro Val Cys Asn Thr Ser Val Lys Gln Val Val Thr Lys
 1730 1735 1740
 Asn Val Pro Val His Cys Ile Gln Gly Thr Lys Thr Ala Tyr Tyr Tyr
 1745 1750 1755 1760
 Lys Ser Leu Ile Asp Gln Gly Gly Asn Pro Asp Phe Ser Arg Lys Ser
 1765 1770 1775
 Glu Thr Arg Thr Ala Arg Met Glu Val Ala Ala Gln Cys Asn
 1780 1785 1790

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 <211> 1862
 <212> PRT
 <213> Blattella germanica

<220>
 <223> German cockroach vitellogenin

<400> 10
 Met Thr Trp Asn Ala Leu Leu Cys Cys Leu Leu Val Ser Ala Ala Ser
 1 5 10 15
 Ala Ile Thr Pro Gly Trp Leu Pro Ile Asn Ser Gln Leu Asp Tyr His
 20 25 30

Val	His	Gly	Arg	Thr	Phe	Ser	Ser	Leu	Phe	Gln	Val	Ala	Asn	Gln	Tyr	35	40	45
Thr	Gly	Ile	Leu	Tyr	Lys	Ala	Arg	Leu	Ser	Leu	Asp	Arg	Asn	Glu	Asp	50	55	60
Gln	Leu	Ile	Thr	Gly	Lys	Val	Thr	Glu	Ala	Gln	Phe	Ser	Pro	Val	Asn	65	70	75
Thr	Gln	Phe	Ser	Ser	Gly	Trp	Asp	Glu	Ser	Val	Pro	Asp	Glu	Lys	Leu	85	90	95
His	Trp	Asp	Val	Val	Pro	Met	Ser	Gln	Gln	Pro	Phe	Gln	Ile	Glu	Leu	100	105	110
Asn	Ser	Arg	Gly	Glu	Val	Arg	Lys	Leu	Arg	Val	Asn	Lys	Phe	Val	Glu	115	120	125
Leu	Trp	Glu	Ile	Asn	Met	Ile	Lys	Ala	Ile	Ile	Ser	Gln	Leu	Gln	Val	130	135	140
Val	Val	Asp	Glu	Asp	Lys	Lys	Val	Tyr	Arg	Val	Phe	Glu	Ser	Thr	Val	145	150	155
Thr	Gly	Arg	Cys	Glu	Ala	Leu	Tyr	Glu	Val	Asp	His	Leu	Tyr	Pro	Thr	165	170	175
Thr	Tyr	Leu	Asn	Pro	Trp	Gln	Trp	Thr	Gln	Gln	His	Asp	Thr	Lys	Leu	180	185	190
Arg	Ile	Met	Lys	Thr	His	Gln	Phe	Thr	Asn	Cys	Arg	His	Asn	Ser	Ala	195	200	205
Tyr	Lys	Leu	His	Phe	Asn	Ala	Phe	Glu	Tyr	Phe	His	Leu	Lys	Gln	His	210	215	220
Lys	Pro	Glu	Thr	Phe	Leu	Ser	Asn	Ser	Ala	Val	Ser	Arg	Val	Ile	Ala	225	230	235
Asp	Gly	Asp	Asn	Leu	Lys	Asn	Phe	Thr	Phe	Tyr	Ser	Gly	Glu	Thr	Ile	245	250	255
His	Lys	Ile	Val	Leu	Asn	Pro	Glu	Ile	Tyr	Asn	Lys	Gln	Lys	Gly	Met	260	265	270
Leu	Val	Ser	His	Ile	Asn	Val	Thr	Val	Glu	Arg	Lys	Gly	Arg	Glu	Leu	275	280	285
Thr	Val	Ile	Asp	Tyr	Glu	Leu	Arg	Asn	Val	Gly	Asp	Leu	Ser	Tyr	Ser	290	295	300
Thr	Ser	Leu	Val	Lys	Ala	His	Ser	Met	Arg	Asn	Ser	Ala	Ser	Met	Asp	305	310	315
Leu	Ser	Ser	Ser	Ser	Met	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	325	330	335
Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Glu	Glu	His	340	345	350

His	Ser	His	Asn	Gln	Lys	Leu	Ser	Lys	Lys	Arg	Gln	Val	Pro	Leu	Pro	355	360	365
Arg	Pro	Leu	Phe	Glu	Ala	Asn	Phe	Asp	Ala	Ser	Ser	Gly	Leu	Thr	Thr	370	375	380
Glu	Gln	Pro	Val	Thr	Phe	Arg	Pro	Arg	Arg	Gln	Leu	Phe	Gln	Gly	Gln	385	390	395
Asp	Met	Ser	Glu	Glu	Glu	Thr	Glu	Gln	Asn	Pro	Glu	Ile	Ile	Pro	Ala	405	410	415
Asn	Leu	Leu	Pro	Thr	Tyr	Asn	Leu	Ile	His	Asn	Thr	Lys	Gln	Val	Asp	420	425	430
Val	Asp	Pro	Val	Gly	Val	Ala	Val	Arg	Leu	Ser	Lys	Asp	Ile	Ala	Ala	435	440	445
Asp	Leu	Gln	Gly	Glu	Pro	Arg	Val	Gly	Glu	Asp	Arg	His	Ile	Leu	Pro	450	455	460
Arg	Phe	Thr	Ile	Leu	Val	Arg	Leu	Leu	Lys	Gln	Leu	Lys	Val	Ser	Gln	465	470	475
Ile	Met	Glu	Ala	Ala	Arg	Lys	Leu	Tyr	Lys	Leu	Glu	Asn	Asp	His	Pro	485	490	495
Asn	Tyr	Met	Asn	Trp	Asp	Thr	Trp	Arg	Val	Tyr	Arg	Asp	Ala	Val	Ser	500	505	510
Gln	Ala	Gly	Thr	Trp	Ser	Ala	Leu	Asn	Ser	Ile	Gln	Gln	Phe	Ile	Ser	515	520	525
Ser	Glu	Met	Val	Glu	Pro	Lys	Glu	Ala	Ser	His	Leu	Ile	Thr	Val	Leu	530	535	540
Pro	Ala	Ala	Val	Ser	Asp	Lys	Asn	Lys	Ala	Tyr	Leu	His	Phe	Leu	Phe	545	550	555
Glu	Met	Thr	Lys	Asp	Pro	Val	Phe	Lys	Asn	Met	Thr	Tyr	Val	Asn	Thr	565	570	575
Ser	Leu	Val	Leu	Ala	Phe	Ser	Glu	Val	Ile	His	Gln	Val	Glu	Met	His	580	585	590
Gln	Val	Arg	Asp	Leu	Lys	Ile	Lys	Ser	Val	Tyr	Ile	Pro	Tyr	Leu	Val	595	600	605
Gln	Glu	Phe	Asp	Asp	Ala	Val	Lys	Glu	Asn	Asn	Ser	Ile	Lys	Ile	Gln	610	615	620
Leu	Tyr	Thr	His	Ala	Leu	Gly	Val	Thr	Gly	Asn	Thr	His	Ile	Leu	His	625	630	635
Tyr	Leu	Arg	Pro	Tyr	Ile	Ile	Gln	Leu	Lys	Thr	Ile	Thr	His	His	Gln	645	650	655
Arg	Leu	Phe	Met	Val	Gln	Ser	Leu	Glu	Arg	Val	Val	Glu	His	Asn	Pro	660	665	670

Arg	Lys	Val	Ile	Asp	Leu	Leu	Leu	Ser	Leu	Tyr	Leu	Asp	Gln	Asn	Glu	675	680	685
His	Ala	Asp	Ile	Arg	Val	Glu	Ala	Leu	Phe	Leu	Leu	Met	Lys	Ala	Asp	690	695	700
Pro	Ser	Ile	His	Val	Leu	Lys	Met	Val	Ala	Glu	Leu	Thr	His	Thr	Glu	705	710	715
Ser	Asn	Asn	Gln	Val	Leu	Ser	Ala	Ser	Gln	Ser	Ala	Ile	Lys	Ser	Ala	725	730	735
Ala	Asn	Val	Glu	Gly	Asp	Ile	Tyr	Ser	Glu	Met	Arg	Arg	Lys	Ala	Lys	740	745	750
Ala	Val	Glu	His	Leu	Leu	Ser	Thr	Arg	Asn	Met	Asp	Val	Ser	Tyr	Ser	755	760	765
Lys	Ser	Tyr	Leu	Tyr	Gly	Tyr	Lys	Ser	Lys	Lys	Ile	Asn	Tyr	Asp	Ser	770	775	780
Leu	Tyr	Asn	Leu	Asn	Tyr	Ile	Gly	Ser	Glu	Asp	Ser	Ile	Tyr	Pro	Lys	785	790	795
Ser	Met	Leu	Leu	Asn	Ile	Phe	Thr	Asn	Asn	Leu	Gly	Arg	Ile	Asn	Thr	805	810	815
His	Val	Gln	Lys	Gly	Tyr	Met	Val	Ser	Ser	Met	Thr	Asp	Leu	Trp	Glu	820	825	830
Ala	Phe	His	Thr	Ile	Tyr	Lys	Lys	Asp	Asn	Gly	Ser	Pro	Thr	Asp	Pro	835	840	845
Lys	Thr	Leu	Val	Lys	Phe	Val	Glu	Gly	Asn	Leu	Lys	Tyr	Phe	Asn	Met	850	855	860
Gly	Val	Gln	Lys	Phe	Trp	Ala	Phe	Asp	Asn	Thr	Thr	Phe	Ser	Asn	Ala	865	870	875
Ser	Ala	Val	Ile	Gln	Glu	Phe	Leu	Lys	Thr	Tyr	Lys	Lys	Pro	Thr	Asn	885	890	895
Phe	Asn	His	Thr	Lys	Leu	Ser	Ser	Ser	Ser	Ser	Ile	Thr	Leu	Thr	Leu	900	905	910
Pro	Cys	Ala	Met	Gly	Leu	Pro	Ala	Tyr	Phe	Lys	Met	Asn	Ser	Pro	Ser	915	920	925
Leu	Trp	Lys	Tyr	Asn	Gly	Glu	Phe	Ser	Ile	Gln	Thr	Asp	Ala	Lys	Thr	930	935	940
Asp	Val	Pro	Met	Ser	Leu	Glu	Asn	Phe	Met	Asn	Ile	Thr	Gly	Ser	Ile	945	950	955
Asn	Leu	Met	Phe	Ser	Gln	Met	Tyr	His	Ala	Gln	Leu	Ala	Phe	Ser	Thr	965	970	975
Ala	Phe	Asp	Asn	Lys	Glu	Tyr	Ile	Ser	Gly	Leu	Asp	Arg	Lys	Val	Glu	980	985	990

Val His Val Pro Val Lys Phe Gln Ile Asn Leu Asp Phe Lys Asn His
995 1000 1005
Asn Gly Phe Ile Arg Ile Ile Pro Leu Phe Thr Asp Arg Asp Tyr Asp
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Val Leu Gln Trp Gln Thr Ile Pro Tyr Thr Thr Ile His Asn Val Pro
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Asp Phe Glu Thr Val Tyr Met Asp Gln Leu Phe Lys Leu Ile His Val
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Arg Lys Thr Ala His Phe Glu Lys Lys Met Gly Glu Asn Thr Gly Ile
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Val Phe Lys Val Lys Tyr Asp Thr Asp Gln Glu Phe Leu Asp Thr Lys
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Trp Phe Leu Asp Glu Phe Lys Val Leu Gln Leu Phe Thr Gly Leu Asn
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Tyr Asp Val Pro Thr Lys Asp Ile Phe Tyr Asn Asn Leu Thr Val Tyr
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Tyr Asp His Glu Asp Thr Lys Asn His Ala Val Ser Phe Thr Val Thr
1125 1130 1135
Lys Glu Gln Ser Lys Phe Tyr Glu Thr Leu Asn Pro Val Val Gln Gln
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Asn Leu Lys Leu Ser Ser Gly Lys Lys Gln Lys His Arg Asn Val Lys
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Ser His Arg Ile Arg Arg Glu Tyr Thr Glu Asp Glu Asn Pro Ala Ile
1170 1175 1180
Pro Lys Asp Lys Gln Pro Asn Ser His Pro Arg Arg Gln Glu Tyr Leu
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Ser Lys Ser Met Ala Leu Thr Gly Asp Ala Thr Ala Val Val Leu Asp
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Met Thr Leu Lys Phe Glu Gly Pro Ala Glu Ser Tyr Phe Thr Thr Thr
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Ser Ala Phe Glu Phe Asp Pro Asn Ser Lys Val His Ala Ile Met Asn
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 Ser Lys Leu Cys Asp His Glu Met Arg Thr Lys Arg Asp His Val Leu
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 Pro Ala Cys Arg Asn Ser Thr Glu Arg Ala Ser Asp Leu Asn Arg Val
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 His Val Asp Ile Asn Tyr Asn Leu Lys Gln His Glu Thr Phe Lys Arg
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 Val Ser Glu Asp Val Ile Val Asp Asn Pro Ala Gln Phe Ile Ser Ala
 1395 1400 1405
 Asn Phe Thr Leu Lys Asp Asn Thr Arg Ala Phe Asn Val Ser Ile Glu
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 Gln Ser Glu Met Leu Arg Met Asn Pro Arg Thr Ser Phe Ala Lys Arg
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 Phe Ala Lys Trp Ala Leu Pro Leu Tyr Tyr Lys Pro Thr Cys Val Val
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 Asp Ser Ser Tyr Ile Asn Thr Phe Asp Asn Phe Thr Tyr Ser Ala His
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 His Ile Val Gln Asn Asp Ala Phe Tyr Thr Ile Leu Asp Ile Pro Gln
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 Ile Glu Leu Lys Pro Asn Gln Gly Met Pro Glu Val Tyr Val Glu Gly
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 Lys Arg Val Asp Tyr Asn His His His Ser Thr Asp Leu Asn Val Ser
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 Gln Asp Arg Ile Gly Tyr Val Tyr Ala Leu Pro Thr Lys Ala Ala His
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 Ile Val Phe Pro Ser Tyr Glu Ile Glu Met Phe Tyr Asp Gly Ser Arg
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 Ile Met Ile Gln Ala Ser Asn Met Tyr Arg Asn Phe Thr Lys Gly Leu
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Gly Cys Tyr Ala Lys Asp Met Ala Leu Phe Val Ala Ser Tyr Ala Asp
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 Asn Ser Asn Ser Glu Val Arg Lys Ile Lys Ala Thr Gln Asn Glu Gln
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 Thr Cys Val Pro Gln Phe His Gln Pro Leu Val Ser His Gln Met Arg
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 Leu Ser Gln Val Ile Lys Leu Ala Asp Thr Ser Ser Ser Ser Glu Ser
 1685 1690 1695
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 1700 1705 1710
 Ser Gln Val Asn Lys Ser Lys Arg Gln Pro Asn Ser Arg Pro Arg Ser
 1715 1720 1725
 Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Glu Ser Asn Glu Ser Val
 1730 1735 1740
 Leu Ala Lys Lys Ile Ile Asn Asn Gln Ile Gly Pro Lys Pro Thr Leu
 1745 1750 1755 1760
 Ile Pro Ser Gln Ser Pro Met Thr Ser Asp Asp Lys Cys Met Thr Gln
 1765 1770 1775
 Gln Pro Arg His Thr Tyr Tyr Glu Asn Gln Phe Cys Val Ser Glu Lys
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 Pro Leu Asp Thr Cys Met Pro Leu Ile Cys His Ala Thr Glu Ser Tyr
 1795 1800 1805
 Thr Ile Asp Val Asn Phe Tyr Cys Val Pro Leu Gly Pro Ala Ala Asn
 1810 1815 1820
 His Tyr Met Lys Leu Val Lys Lys Gly Ile Leu Pro Asp Leu Ser Arg
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Leu	Ala	Ala	Pro	Trp	Gly	Ala	Asp	Leu	Pro	Arg	Cys	Ser	Thr	Glu	Cys	
			20					25					30			
Pro	Ile	Ser	Gly	Ser	Pro	Lys	Leu	Ala	Tyr	Gln	Pro	Glu	Lys	Thr	Tyr	
		35				40						45				
Thr	Tyr	Gln	Tyr	Ser	Gly	Lys	Ser	Arg	Val	Gln	Leu	Lys	Gly	Val	Asp	
	50					55					60					
Asp	Gly	Val	Ser	Glu	Thr	Glu	Trp	Ala	Ala	Arg	Val	Asp	Leu	Thr	Trp	
65					70					75					80	
Ile	Ser	Pro	Cys	Asp	Val	Ala	Ile	Ser	Phe	Asn	Asn	Met	Lys	Met	Asp	
				85					90					95		
Gly	Ala	Arg	Gly	Pro	Ile	Ala	Ala	Arg	Thr	Leu	Glu	Arg	His	Pro	Leu	
			100					105					110			
Val	Val	Ala	Val	Val	Asp	Gly	Arg	Val	Gln	His	Val	Cys	Ala	His	Pro	
		115					120					125				
Asp	Asp	Glu	Pro	Trp	Ala	Ile	Asn	Leu	Lys	Lys	Gly	Val	Ala	Ser	Ala	
	130					135					140					
Phe	Gln	Asn	Ser	Ile	Pro	Ser	Leu	Ser	Thr	Val	Ser	Ser	Gly	Met	Thr	
145				150						155					160	
Val	Thr	Glu	Thr	Asp	Val	Val	Gly	Lys	Cys	Pro	Thr	Thr	Tyr	Gln	Ile	
				165					170					175		
Glu	Thr	Glu	Gly	Glu	Lys	Val	Ile	Val	Val	Lys	Glu	Lys	Asn	His	Arg	
			180					185					190			
His	Cys	Gln	Gln	Arg	Tyr	Pro	Thr	Pro	Ala	Glu	Thr	Pro	Ala	Pro	Trp	
		195				200						205				
Leu	Lys	Ala	Pro	Leu	Pro	Ile	Glu	Glu	Ser	Lys	Ser	Glu	Cys	Lys	Gln	
	210					215					220					
Glu	Ile	Thr	Asn	Gly	Ile	Tyr	Thr	Ser	Ile	Met	Cys	His	Asp	Lys	Asn	
225					230					235					240	
Ile	Val	Arg	Pro	Ala	Ile	Gly	Ile	Tyr	Lys	Tyr	Val	Glu	Ala	Asn	Gln	
				245					250					255		
Glu	Ser	Thr	Leu	His	Phe	Ile	Ser	Glu	Thr	Thr	Asp	Thr	Ser	Ala	Ile	
			260					265						270		
Thr	Ala	Ile	Pro	Arg	Gly	Glu	Met	His	Ile	Glu	Ser	Leu	Leu	Tyr	Asn	
		275					280					285				
His	Glu	Thr	Met	Lys	Asp	Pro	Glu	Leu	Ala	Pro	Glu	Leu	Asp	Gln	Leu	
	290					295					300					
Met	Lys	Glu	Ile	Cys	Glu	Lys	Thr	Lys	Asp	Thr	Val	Glu	Ala	Glu	Ala	
305					310					315					320	

Ala	Ala	Leu	Val	Ala	Lys	Ala	Leu	His	Leu	Leu	Arg	Arg	Val	Pro	Glu	325	330	335
Thr	Val	Val	Val	Glu	Ile	Ala	Gln	Lys	Val	Arg	Gln	Gly	His	Tyr	Cys	340	345	350
Ser	Asp	Ser	Ala	Lys	Leu	Glu	Ser	Ile	Phe	Leu	Asp	Ala	Val	Ala	Phe	355	360	365
Leu	His	Glu	Ser	Gly	Ala	Val	Lys	Val	Met	Val	Gln	Glu	Ile	Leu	Asn	370	375	380
Gly	Arg	Ala	Thr	Gly	Gly	Arg	Leu	Ala	Leu	Tyr	Thr	Ala	Ala	Leu	Tyr	385	390	395
Leu	Thr	Pro	Arg	Pro	Asn	Ile	Glu	Ala	Val	Lys	Ala	Leu	Thr	Pro	Leu	405	410	415
Phe	Glu	Ser	Pro	Arg	Pro	Met	Pro	Ser	Leu	Leu	Leu	Ala	Ala	Ala	Ser	420	425	430
Met	Val	Asn	His	Tyr	Cys	Arg	His	Thr	Pro	His	Cys	His	Gln	Glu	Ala	435	440	445
Pro	Val	Glu	Arg	Ile	Ala	Glu	Ile	Leu	Ala	Ala	Lys	Val	Glu	Gly	His	450	455	460
Cys	Ser	Pro	Ser	Ile	Gly	Val	Glu	Glu	Lys	Glu	Glu	Ala	Leu	Ala	Ile	465	470	475
Phe	Lys	Ala	Leu	Gly	Asn	Met	Gly	Val	Val	Thr	Pro	Ala	Val	Thr	Arg	485	490	495
Ala	Ala	Ala	Gln	Cys	Ile	Glu	Lys	Glu	Gly	Leu	Glu	Thr	Ser	Ile	Arg	500	505	510
Val	Ala	Ala	Ala	Gln	Ala	Phe	Arg	Gln	Ala	Asn	Cys	Asp	Arg	Pro	Ala	515	520	525
Val	Gln	Lys	Leu	Val	Asp	Ile	Ala	Thr	Arg	Pro	Thr	Phe	Glu	Thr	Glu	530	535	540
Val	Arg	Ile	Ala	Ser	Tyr	Leu	Ala	Ala	Ile	Arg	Cys	Ala	Glu	Lys	Glu	545	550	555
His	Leu	Glu	Gln	Ile	Ile	Glu	Lys	Ile	Ser	Glu	Glu	Glu	Asn	Thr	Gln	565	570	575
Val	Arg	Gly	Phe	Val	Leu	Gly	His	Leu	Ile	Asn	Ile	Gln	Glu	Ser	Thr	580	585	590
Cys	Pro	Thr	Lys	Glu	Asn	Leu	Lys	Tyr	Leu	Leu	Thr	Asn	Val	Val	Ile	595	600	605
Pro	Thr	Asp	Phe	Glu	Lys	Asp	Phe	Arg	Lys	Phe	Ser	Arg	Asn	Val	Glu	610	615	620
Met	Ser	Tyr	His	Ala	Pro	Ala	Phe	Gly	Met	Gly	Ala	Asp	Leu	Glu	Ser	625	630	635

Asn	Ile	Ile	Tyr	Ala	Pro	Gly	Ser	Phe	Ile	Pro	Arg	Ala	Val	Asn	Leu	645	650	655
Asn	Met	Lys	Ala	Ala	Val	Asp	Glu	Thr	His	Met	Asp	Leu	Ala	Glu	Ile	660	665	670
Gly	Ala	Arg	Phe	Glu	Gly	Ile	Asp	Ser	Ile	Ile	Glu	Glu	Leu	Phe	Gly	675	680	685
Pro	Glu	Gly	Tyr	Leu	Arg	Lys	Ala	Thr	Phe	Gly	Lys	Ile	Met	Gln	Asp	690	695	700
Ile	Thr	Gly	Phe	Ala	Glu	Glu	Lys	Gly	Leu	Lys	Val	Met	Glu	His	Ile	705	710	715
Lys	Gln	Thr	Leu	Arg	Thr	Lys	Arg	Ser	Ile	Asp	Ser	Ser	Val	Ile	Ser	725	730	735
Asp	Phe	Phe	Gly	Lys	Leu	Tyr	Gly	Glu	Gly	Arg	Ser	His	Thr	His	Ala	740	745	750
Glu	Val	Phe	Ala	Arg	Ile	Met	Gly	His	Glu	Ile	Thr	Tyr	Ala	Asp	Val	755	760	765
Ala	Glu	Ser	Leu	Lys	Gly	Val	Thr	Ala	Asp	Thr	Leu	Ile	Glu	Thr	Phe	770	775	780
Phe	Ser	Phe	Phe	Glu	Glu	Ser	Leu	Glu	Gln	Met	Lys	Gly	Leu	Asn	Leu	785	790	795
Asn	Thr	Ala	Arg	Thr	Ala	Gln	Leu	Tyr	Met	Asp	Tyr	Ser	Leu	Pro	Thr	805	810	815
Ile	Gln	Gly	Thr	Pro	Leu	Lys	Leu	Lys	Leu	Ala	Gly	Thr	Ala	Val	Ala	820	825	830
Gly	Leu	Lys	Met	Glu	Gly	Asp	Phe	Asn	Ile	Ala	Gln	Ile	Leu	Ser	Asp	835	840	845
Pro	Gly	Asn	Leu	Gln	Thr	Gly	Ile	Lys	Leu	Phe	Pro	Ala	Leu	Ser	Val	850	855	860
Gln	Ala	Thr	Gly	Phe	Val	Gly	Phe	Glu	Cys	Arg	Leu	Thr	Arg	Val	Gly	865	870	875
Ile	Glu	Met	Glu	Asn	Thr	Ile	Ser	Ser	Ala	Thr	Gly	Ala	Ser	Ile	Asn	885	890	895
Ile	Arg	Thr	Thr	Glu	Asn	Lys	Lys	Ile	Gln	Met	Glu	Leu	Glu	Ile	Pro	900	905	910
Glu	Lys	Met	Glu	Leu	Leu	Asn	Ile	Lys	Ala	Glu	Thr	Tyr	Leu	Val	Lys	915	920	925
Ala	Val	Gly	Lys	Lys	Leu	Thr	Lys	Ile	Thr	Pro	Pro	Thr	Val	Arg	Asp	930	935	940
Val	Arg	Val	Thr	His	Ala	Ala	Cys	Leu	Asn	Ala	Val	Glu	Pro	Val	Leu	945	950	955

Gly Ile Lys Val Cys Tyr Asn Ile Asn Met Pro Asp Val Phe Arg Ala
 965 970 975
 Asn Gly Leu Pro Leu Gly Glu Pro Ala Ile Ala Lys Leu Tyr Ile Glu
 980 985 990
 Lys Ala Asp Pro Ser Met Arg Gly Tyr Leu Met Thr Ala Ala Ile Lys
 995 1000 1005
 Asn Lys Lys Gly Asn Lys Phe Ile Lys Leu Asn Val Glu Ala Ala Gly
 1010 1015 1020
 Ala Thr Thr Pro Arg Arg Ala Glu Met Thr Leu Ser Tyr Thr Lys Glu
 1025 1030 1035 1040
 Glu Gly Ser His Ile Val Ser Ala Lys Leu Asp Ser Ser Ser Ile Ala
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 Ala Gly Val Trp Ala Thr Leu Thr Asn Glu Glu Gly His Lys Ala Met
 1060 1065 1070
 Glu Thr Tyr Val Lys Phe Asp Tyr Gly Gln Ile Ala Ile Ser Arg Gly
 1075 1080 1085
 Ile Lys Leu Asp Met Ile Val Lys Glu Glu Ser Ala Gly Lys Glu Phe
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 Glu Val Asn Val Phe Ser Gly Arg Ser Arg Arg Phe Thr Pro Glu Ser
 1105 1110 1115 1120
 His Ile Val Glu Ala Lys Phe Ile Lys Lys Thr Asn Gly Pro Glu Val
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 Asn Val Asp Val Ile Cys Arg Thr Arg Asn Ala Leu Ala Gln Tyr Phe
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 Asp Leu Asn Ile Glu Val Gly Ala Asp Phe Met Glu Phe Ser Pro Glu
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 Gly Val Tyr Pro Ala Arg Tyr Ile Pro Lys Val Ser Ile Leu Leu Pro
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 Val Ala Leu Arg Lys Met Glu Val His Ala Asn Thr Val Ala Trp Lys
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 Leu Ala Ser Tyr Ile Arg Glu Gly Ser Gln Ser Gly Glu Ser Arg Glu
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 Val Gln Ala Thr His Lys Ile Glu Gly Thr Leu Pro Gln Asn Ile Val
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 Met Tyr Asp Ile Phe Tyr His Pro Glu Lys Met Gly Ala Ser Val Glu
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Val Phe Arg Thr Ala Gly Asn Glu Lys Val Ala Glu Met Glu Ala Ile
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Tyr Glu Asn Thr Gly Glu Lys Tyr Tyr Thr Lys Phe Leu Val Glu Ala
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Pro Gly Tyr Ile Arg Pro Val Arg Ile Glu Ala Thr Ala Glu Glu Glu
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Ser Tyr Arg Arg Arg Val Lys Gly Phe Ala Asp Val Asn Ile Gly Glu
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Lys Arg Ala Asn Val Glu Phe Ser Trp Asp Ala Asp Lys Ser Pro Glu
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Gly Glu Asn Gly Phe Lys Leu Leu Leu Thr Thr Pro Ser Gln Lys Thr
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Lys Val Val Ser Val Ile Glu Tyr Lys Asn Met Glu Asn Lys Glu Tyr
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Lys Tyr Thr Ser Val Ile Ala Leu Glu Lys Leu Gly Gly Pro Tyr Asn
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Tyr Val Val Lys Ala Lys Val Ile Tyr Lys Gln Pro Glu Thr Gln Glu
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Ile Met Leu Glu Thr Glu Val Lys His Gln Trp Thr Pro Glu Glu His
1620 1625 1630
Leu Val Ala Phe Lys Val Gly Ala Lys Ala Pro Val Leu Lys Met Pro
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Phe Cys Lys Ile Glu Arg Asn Thr Pro Ser Asn Val Phe Glu Trp Lys
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Ile Gln Met Thr Pro Glu Gly Gly Ile Glu Val Val Glu Ala Gly Leu
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Asp Ile Lys Ala Ile Asn Glu Val Leu Lys Ile Val His Ala Val Val
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Thr Phe Glu Glu Glu Gly Tyr Gln Ala Tyr Gly Gln Glu Thr Ala Lys
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Tyr Gln Tyr Arg Phe Thr Arg Pro Ser Pro Thr Thr Tyr Ile Met Gln
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Met Arg Thr Pro Thr Arg Thr Ile Glu Gly Arg Ala Lys Leu Ser Pro
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Arg Glu Ser Gly Ile Lys Phe Tyr Pro Asn Lys Gly Lys Ala Glu Ala
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Lys Tyr Glu Val Gly Tyr Lys Ala Asn His Gln Gly Ser Trp Gly Gln
1780 1785 1790
His Ala Ser Asn Ile Glu Val Arg Met Asn His Pro Thr Leu Pro Lys
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Pro Ile Met Val Ala Ala His Tyr Thr Ala Ile Gly Glu Thr Ile Lys
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Gly Thr Ile Glu Leu Asp Ile Phe Pro Glu Glu Glu Asn Lys Ile Thr
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Gly Thr Leu Glu Thr Gln Arg Ile Ser Glu Asn Ala Ile Arg Val Glu
1845 1850 1855
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1860 1865 1870
Thr Val Ala Tyr Ala Pro Glu Thr Phe Ala Leu Asp Val Val Phe His
1875 1880 1885
Lys Thr Pro Ser Thr Ala Pro Val Phe Ala Leu Ala Ala Lys Tyr Asp
1890 1895 1900
Lys Thr Ser Ala His Asn Ala Ala Ala Thr Phe Thr Val Glu Met Glu
1905 1910 1915 1920

Gln Arg Pro Val Phe Glu Ile Thr Ala Val Ala Glu Pro Glu Glu Glu
 1925 1930 1935
 Val Pro Cys Asn Gly Ile Arg Ile Lys Ala Ile Ala Asn Ala Pro Ala
 1940 1945 1950
 Phe Gly Lys Tyr Asn Ile Phe Ser Lys Met Cys Lys Pro Ala Phe Ile
 1955 1960 1965
 Glu Leu Thr Thr Met Arg His Gly Gly Glu Lys Glu Tyr Thr Ala Arg
 1970 1975 1980
 Leu Gly Leu Arg Tyr Pro Asp Thr Ala Glu Ala Gly Val Tyr Val Ala
 1985 1990 1995 2000
 Ser Gly Arg Ala Glu Glu Ile Arg Gly Val Ala Val Ala Val Lys
 2005 2010 2015
 Leu Ala Ser Pro Thr Met Leu Lys Val Glu Met Ala Tyr Gly Pro Glu
 2020 2025 2030
 Glu Ala Gln Val Leu Met Asn Glu Met Thr Glu Glu Tyr Glu Lys Ala
 2035 2040 2045
 Ala Val Leu Phe Lys Ser Val Val Met Glu Val Val His Phe Leu Glu
 2050 2055 2060
 Glu Glu Ala Ser Ala Lys Gly Ile His Phe Pro Ser Ser Gln Leu Val
 2065 2070 2075 2080
 Thr Leu Leu Gly Val Ala Lys Glu Glu Ile Glu Glu Ile Tyr Arg Asp
 2085 2090 2095
 Ile Leu Ser Asp Ala Arg Ile Phe Asp Thr Glu Ile Ile Arg Asp Ile
 2100 2105 2110
 Leu Ala Ser Pro Val Val Ser Phe Val Pro Arg Val Tyr Phe Gly Val
 2115 2120 2125
 Trp Ser Glu Ile Val Leu Leu Gln His Gln Leu Ser Val Asn Ile Ile
 2130 2135 2140
 Gln Ala Ile Glu Arg Phe Gln Gly Glu Phe Glu Gly Ile Thr Glu Ile
 2145 2150 2155 2160
 Ile Met Glu Ile Val Met Glu Ala Thr Arg Met Ala Glu Thr Gly Glu
 2165 2170 2175
 Val Pro Lys Val Leu Leu Asp Val Leu Glu Gln Ile Arg Ala Ser Lys
 2180 2185 2190
 Val Phe Arg Ile Val Lys Arg Glu Val Tyr Glu Ile Leu Glu Glu Tyr
 2195 2200 2205
 Pro Glu Glu Tyr Glu Ala Ile Thr His Val Val Gly Asn Val Met Ala
 2210 2215 2220
 Met Leu Glu Arg Asp Val Glu Ile Val Arg Val Gly Leu Met Lys Met
 2225 2230 2235 2240

Pro	Ala	Val	Gln	Arg	Ile	Ile	Asp	Tyr	Ile	Met	Asn	His	Phe	His	Ser	
				2245					2250						2255	
Lys	Gln	Val	Phe	Ala	Val	Glu	Ala	Glu	Arg	Val	Val	Ser	Leu	Ile	Leu	
		2260						2265					2270			
Ser	Glu	Leu	Leu	Tyr	Val	Ser	Ile	Glu	Arg	Glu	Gly	Asn	Gly	Ile	Glu	
		2275					2280					2285				
Val	Gln	Ile	Pro	Leu	His	Arg	Pro	Leu	Tyr	Ser	Leu	Thr	Gln	Val	Ala	
		2290				2295					2300					
Gln	Glu	Ala	Val	Pro	Asn	Pro	Ile	Thr	Met	Leu	Glu	Asn	Leu	Ile	Phe	
2305					2310					2315					2320	
Ala	Tyr	Leu	Glu	Tyr	Ile	Pro	Ile	Pro	Val	Glu	His	Ala	Ile	Trp	Ala	
				2325					2330					2335		
Tyr	Tyr	Asn	Phe	Ile	Pro	Arg	Tyr	Ile	Thr	Asp	Val	Leu	Pro	Pro	Tyr	
			2340					2345					2350			
Pro	Arg	Thr	Ala	Met	Val	Val	Gly	Gly	Ser	Glu	Ile	Leu	Thr	Phe	Asp	
		2355					2360					2365				
Gly	Leu	Val	Val	Arg	Ala	Pro	Arg	Ser	Pro	Cys	Lys	Val	Leu	Leu	Ala	
	2370					2375					2380					
Ala	His	Gly	Ser	His	Arg	Leu	Met	Met	Ser	His	Pro	Gln	Pro	Ser	Ala	
2385					2390					2395					2400	
Pro	Pro	Gln	Leu	Glu	Leu	Asn	Thr	Pro	Ala	Ala	Ser	Val	Val	Ile	Lys	
			2405						2410					2415		
Pro	Asp	Phe	Glu	Val	Leu	Val	Asn	Gly	Arg	Pro	Leu	Thr	Gly	Ser	Gln	
		2420						2425					2430			
Gln	Thr	Ile	Gly	Asn	Ile	Arg	Ile	Val	Asn	Ala	Ala	Lys	His	Ile	Glu	
	2435						2440					2445				
Val	Gly	Cys	Pro	Leu	Met	Lys	Val	Val	Val	Ala	Lys	Thr	Gly	Gln	Val	
	2450					2455					2460					
Val	Ala	Val	Glu	Ala	Ser	Gly	Trp	Thr	Tyr	Gly	Arg	Val	Ala	Gly	Leu	
2465					2470					2475					2480	
Leu	Gly	Pro	Asn	Thr	Gly	Glu	Ile	Ala	Asp	Asp	Arg	Leu	Met	Pro	Thr	
			2485						2490					2495		
Gly	Val	Gln	Ala	Ser	Ser	Pro	Arg	Glu	Leu	Val	Ser	Ala	Trp	Gln	Glu	
		2500						2505					2510			
Asp	Gln	Gly	Cys	Ser	Thr	Pro	Glu	Val	Pro	Arg	Ser	Glu	Thr	Thr	Val	
		2515					2520					2525				
Ala	Arg	Leu	Ile	Gln	Cys	Gln	Thr	Leu	Leu	Gly	Ile	Arg	Ser	Arg	Cys	
	2530					2535					2540					
Asn	Pro	Val	Val	Gln	Pro	Gln	Pro	Phe	Ile	Asn	Met	Cys	His	Ala	Ala	
2545					2550					2555					2560	

Arg Asn Ala Cys Asp Ala Ala Gln Ala Tyr Arg Thr Ile Cys Ala Leu
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Arg Gly Val Glu Glu Met Arg Pro Trp Ala Cys
2580 2585

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<220>
<223> nematode vitellogenin

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Ser Pro Ala Leu Asp Arg Thr Phe Ser Pro Lys Ser Glu Tyr Val Tyr
20 25 30
Lys Phe Asp Gly Leu Leu Leu Ser Gly Leu Pro Thr Arg Ser Ser Asp
35 40 45
Ala Ser Gln Thr Leu Ile Ser Cys Arg Thr Arg Leu Gln Ala Val Asp
50 55 60
Asp Arg Tyr Ile His Leu Gln Leu Thr Asp Ile Gln Tyr Ser Ala Ser
65 70 75 80
His Ile Pro Gln Ser Glu Gln Trp Pro Lys Ile Glu Ser Leu Glu Gln
85 90 95
Arg Glu Leu Ser Asp Glu Phe Lys Glu Leu Leu Glu Leu Pro Phe Arg
100 105 110
Ala Gln Ile Arg Asn Gly Leu Ile Ser Glu Ile Gln Phe Ser Ser Glu
115 120 125
Asp Ala Glu Trp Ser Lys Asn Ala Lys Arg Ser Ile Leu Asn Leu Phe
130 135 140
Ser Leu Arg Lys Ser Ala Pro Val Asp Glu Met Asn Gln Asp Gln Lys
145 150 155 160
Asp Met Glu Ser Asp Lys Asp Ser Val Phe Phe Asn Val His Glu Lys
165 170 175
Thr Met Glu Gly Asp Cys Arg Ser Arg Leu His Ile Val Gln Glu Gly
180 185 190
Glu Lys Thr Ile Tyr Thr Lys Ser Val Asn Phe Asp Lys Cys Ile Thr
195 200 205
Arg Pro Glu Thr Ala Tyr Gly Leu Arg Phe Gly Ser Glu Cys Lys Glu
210 215 220
Cys Glu Lys Glu Gly Gln Phe Val Lys Pro Gln Thr Val Tyr Thr Tyr
225 230 235 240

Thr	Phe	Lys	Asn	Glu	Lys	Leu	Gln	Glu	Ser	Glu	Val	His	Ser	Val	Tyr	245	250	255
Thr	Leu	Asn	Val	Asn	Gly	Gln	Glu	Val	Val	Lys	Ser	Glu	Thr	Arg	Ala	260	265	270
Lys	Val	Thr	Phe	Val	Glu	Glu	Ser	Lys	Ile	Asn	Arg	Glu	Ile	Lys	Lys	275	280	285
Val	Ser	Gly	Pro	Lys	Glu	Glu	Ile	Val	Tyr	Ser	Met	Glu	Asn	Glu	Lys	290	295	300
Leu	Ile	Glu	Gln	Phe	Tyr	Gln	Gln	Gly	Asp	Lys	Ala	Glu	Val	Asn	Pro	305	310	315
Phe	Lys	Ala	Ile	Glu	Met	Glu	Gln	Lys	Val	Glu	Gln	Leu	Gln	Glu	Ile	325	330	335
Phe	Arg	Gln	Ile	Gln	Glu	His	Glu	Gln	Asn	Thr	Pro	Glu	Thr	Val	His	340	345	350
Leu	Ile	Ala	Arg	Ala	Val	Arg	Met	Phe	Arg	Met	Cys	Thr	Ile	Glu	Glu	355	360	365
Leu	Lys	Lys	Val	His	Thr	Thr	Ile	Tyr	Thr	Lys	Ala	Glu	Lys	Lys	Val	370	375	380
Gln	Leu	Val	Ile	Glu	Thr	Ser	Ile	Ala	Val	Ala	Gly	Thr	Lys	Asn	Thr	385	390	395
Ile	Gln	His	Leu	Ile	His	His	Phe	Glu	Lys	Lys	Ser	Ile	Thr	Pro	Leu	405	410	415
Arg	Ala	Ala	Glu	Leu	Leu	Lys	Ser	Val	Gln	Glu	Thr	Leu	Tyr	Pro	Ser	420	425	430
Glu	His	Ile	Ala	Asp	Leu	Leu	Ile	Gln	Leu	Ala	Gln	Ser	Pro	Leu	Ser	435	440	445
Glu	Lys	Tyr	Glu	Pro	Leu	Arg	Gln	Ser	Ala	Trp	Leu	Ala	Ala	Gly	Ser	450	455	460
Val	Val	Arg	Gly	Phe	Ala	Ser	Lys	Thr	Gln	Asp	Leu	Pro	Leu	Ile	Arg	465	470	475
Pro	Ala	Ser	Arg	Gln	Thr	Lys	Glu	Lys	Tyr	Val	Arg	Val	Phe	Met	Gln	485	490	495
His	Phe	Arg	Asn	Ala	Asp	Ser	Thr	Tyr	Glu	Lys	Val	Leu	Ala	Leu	Lys	500	505	510
Thr	Leu	Gly	Asn	Ala	Gly	Ile	Asp	Leu	Ser	Val	Tyr	Glu	Leu	Val	Gln	515	520	525
Ile	Ile	Gln	Asp	Pro	Arg	Gln	Pro	Leu	Ser	Ile	Arg	Thr	Glu	Ala	Val	530	535	540
Asp	Ala	Leu	Arg	Leu	Leu	Lys	Asp	Val	Met	Pro	Arg	Lys	Ile	Gln	Lys	545	550	555

Val	Leu	Leu	Pro	Val	Tyr	Lys	Asn	Arg	Gln	Asn	Lys	Pro	Glu	Leu	Arg	565	570	575
Met	Ala	Ala	Leu	Trp	Arg	Met	Met	His	Thr	Ile	Pro	Glu	Glu	Pro	Val	580	585	590
Leu	Ala	His	Ile	Val	Ser	Gln	Met	Glu	Asn	Glu	Ser	Asn	Gln	His	Val	595	600	605
Ala	Ala	Phe	Thr	Tyr	His	Val	Leu	Arg	Gln	Phe	Tyr	Lys	Ser	Thr	Asn	610	615	620
Pro	Cys	Tyr	Gln	Gln	Leu	Ala	Val	Arg	Cys	Ser	Lys	Ile	Leu	Leu	Phe	625	630	635
Thr	Arg	Tyr	Gln	Pro	Gln	Glu	Gln	Met	Leu	Ser	Thr	Tyr	Ser	Gln	Leu	645	650	655
Pro	Leu	Phe	Asn	Ser	Glu	Trp	Leu	Ser	Gly	Val	Gln	Phe	Asp	Phe	Ala	660	665	670
Thr	Ile	Phe	Glu	Lys	Asn	Ala	Phe	Leu	Pro	Lys	Glu	Val	Gln	Ala	Ser	675	680	685
Leu	Glu	Thr	Val	Phe	Gly	Gly	Asn	Trp	Asn	Lys	Tyr	Phe	Ala	Gln	Val	690	695	700
Gly	Phe	Ser	Gln	Gln	Asn	Phe	Glu	Gln	Val	Ile	Leu	Lys	Thr	Leu	Glu	705	710	715
Lys	Leu	Ser	Leu	Tyr	Gly	Lys	Gln	Ser	Asp	Glu	Leu	Arg	Ser	Arg	Arg	725	730	735
Val	Gln	Ser	Gly	Ile	Gln	Met	Leu	Gln	Glu	Ile	Val	Lys	Lys	Met	Asn	740	745	750
Ile	Arg	Pro	Arg	Val	Gln	Gln	Thr	Asp	Ser	Gln	Asn	Ala	His	Ala	Val	755	760	765
Phe	Tyr	Leu	Arg	Tyr	Lys	Glu	Met	Asp	Tyr	Ile	Val	Leu	Pro	Ile	Asp	770	775	780
Met	Glu	Thr	Ile	Asp	Thr	Leu	Val	Glu	Lys	Tyr	Val	Arg	Asn	Gly	Glu	785	790	795
Phe	Asp	Ile	Lys	Ser	Leu	Leu	Thr	Phe	Leu	Thr	Asn	Asp	Ser	Lys	Phe	805	810	815
Glu	Leu	His	Arg	Ala	Leu	Phe	Phe	Tyr	Glu	Ala	Glu	Arg	Arg	Ile	Pro	820	825	830
Thr	Thr	Ile	Gly	Met	Pro	Leu	Thr	Ile	Ser	Gly	Lys	Met	Pro	Thr	Ile	835	840	845
Leu	Ser	Ile	Asn	Gly	Lys	Val	Ser	Ile	Glu	Leu	Glu	Lys	Leu	Gly	Ala	850	855	860
Arg	Leu	Val	Leu	Asp	Ile	Val	Pro	Thr	Val	Ala	Thr	Thr	His	Val	Thr	865	870	875
																880		

Glu	Met	Pro	Leu	Leu	Tyr	Pro	Val	Ile	Glu	Gln	Gly	Val	Lys	Ser	Leu	
				885					890					895		
Gln	Ser	Ala	Arg	Leu	His	Thr	Pro	Leu	Arg	Phe	Glu	Ser	Thr	Val	Glu	
			900					905					910			
Leu	Lys	Lys	Asn	Thr	Leu	Glu	Ile	Thr	His	Lys	Phe	Val	Val	Pro	Glu	
		915					920					925				
Asn	Lys	Lys	Thr	Thr	Val	Ser	Val	His	Thr	Arg	Pro	Val	Ala	Phe	Ile	
	930					935					940					
Arg	Val	Pro	Lys	Asn	Gln	Asp	Ser	Glu	Tyr	Val	Glu	Ala	Glu	Glu	Lys	
945				950						955					960	
Thr	Ile	Ser	His	Ser	Gln	Tyr	Gln	Met	Ser	Thr	Glu	Glu	Ile	Asp	Arg	
				965					970					975		
Gln	Tyr	Glu	Thr	Phe	Gly	Leu	Arg	Ile	Asn	Ala	Gln	Gly	Asn	Val	Leu	
			980					985					990			
Ser	Gln	Trp	Thr	Leu	Pro	Met	Val	Leu	Met	Thr	Glu	Gln	Asp	Phe	Glu	
		995				1000						1005				
Tyr	Thr	Leu	Glu	Asn	Lys	Asn	Arg	Pro	Val	Glu	Phe	Thr	Ala	Arg	Val	
	1010					1015					1020					
Thr	Ile	Gly	Asn	Leu	Glu	Lys	Thr	Asp	Leu	Ser	Glu	Ile	Lys	Phe	Asp	
1025				1030						1035					1040	
Lys	Ile	Phe	Glu	Lys	Glu	Phe	Asp	Leu	Glu	Asn	Asn	Glu	Ser	Glu	Asn	
			1045					1050						1055		
Arg	Arg	Gln	Tyr	Phe	His	Lys	Met	Ile	Arg	Glu	Ile	Gln	Ser	Glu	Gln	
		1060					1065						1070			
Gly	Phe	Lys	Asn	Leu	Ile	Thr	Leu	Lys	Leu	Glu	Ala	Pro	Gln	Gln	Met	
	1075					1080						1085				
Tyr	Trp	Asn	Thr	Glu	Leu	Arg	Thr	Val	Cys	Asp	Lys	Trp	Ile	Arg	Met	
	1090				1095						1100					
Cys	Lys	Val	Glu	Met	Asp	Ala	Arg	Arg	Ser	Pro	Met	Glu	His	Glu	Asn	
1105				1110						1115				1120		
Lys	Glu	Trp	Thr	Leu	Arg	Thr	Glu	Leu	Leu	Ala	Ala	Arg	Pro	Gln	Met	
			1125					1130						1135		
Pro	Ser	Ser	Leu	Arg	Gln	Leu	Arg	Glu	Gln	Pro	His	Arg	Glu	Val	Gln	
		1140					1145						1150			
Leu	Ala	Phe	Asn	Ala	Lys	Trp	Gly	Ser	Ser	Lys	Lys	Ser	Glu	Ile	Thr	
	1155						1160					1165				
Val	Asn	Ala	Gln	Leu	Glu	Gln	Ser	Thr	Glu	Gln	Lys	Lys	Phe	Ile	Arg	
	1170					1175					1180					
Asn	Ile	Glu	Arg	Glu	Tyr	Lys	Gly	Ile	Pro	Glu	Tyr	Glu	Leu	Leu	Ile	
1185				1190						1195					1200	

Lys Ala Ala Arg Leu Asn Gln Val Asn Val Val Ser Glu Tyr Lys Leu
 1205 1210 1215
 Thr Pro Gln Ser Glu Tyr Thr Phe Ser Arg Ile Phe Asp Leu Ile Lys
 1220 1225 1230
 Ala Tyr Asn Phe Trp Thr Val Ser Glu Lys Arg Val Gln Asn Glu Asn
 1235 1240 1245
 Arg Arg Val Val Leu Gln Leu Ser Val Glu Pro Leu Ser Arg Gln Ser
 1250 1255 1260
 His Glu His Asp His Gln Thr Pro Glu Gln Glu Val Glu Leu Lys Asn
 1265 1270 1275 1280
 Ala Arg Ile Pro Arg Val Val Leu Pro Thr Ile Ala Arg Ser Ala Met
 1285 1290 1295
 Phe Gln Gln Thr Trp Glu Lys Thr Gly Ala Thr Cys Lys Val Asp Gln
 1300 1305 1310
 Ser Glu Val Ser Thr Phe His Asn Val Ile Tyr Arg Ala Pro Leu Thr
 1315 1320 1325
 Thr Cys Tyr Ser Leu Val Ala Lys Asp Cys Ser Glu Gln Pro Arg Phe
 1330 1335 1340
 Ala Val Leu Ala Lys Lys Ile Asn Lys Asn Ser Glu Glu Leu Leu Val
 1345 1350 1355 1360
 Lys Val Val Arg Arg Glu Glu Glu Ile Val Val Lys Lys Ser Asp Asp
 1365 1370 1375
 Lys Phe Leu Val Lys Val Asp Gly Lys Lys Val Asn Pro Thr Glu Leu
 1380 1385 1390
 Glu Gln Tyr Asn Ile Glu Ile Leu Gly Asp Asn Leu Ile Val Ile Arg
 1395 1400 1405
 Leu Pro Gln Gly Glu Val Arg Phe Asp Gly Tyr Thr Val Lys Thr Asn
 1410 1415 1420
 Met Pro Ser Val Ala Ser Gln Asn Gln Leu Cys Gly Leu Cys Gly Asn
 1425 1430 1435 1440
 Asn Asp Gly Glu Arg Asp Asn Glu Phe Met Thr Ala Asp Asn Tyr Glu
 1445 1450 1455
 Thr Glu Asp Val Glu Glu Phe His Arg Ser Tyr Leu Leu Lys Asn Glu
 1460 1465 1470
 Glu Cys Glu Phe Glu Phe Asp Arg Ile Ser Glu Lys Lys Asn Tyr Arg
 1475 1480 1485
 Asn Lys Trp Asn Arg Glu Glu Lys Lys Ser Asp Tyr Glu Ser Ser Ser
 1490 1495 1500
 Asp Tyr Glu Ser Asn Tyr Asp Glu Lys Glu Thr Glu Glu Glu Leu Val
 1505 1510 1515 1520

Lys Lys Thr Leu Ile Lys Glu Phe Ser Asn Arg Val Cys Phe Ser Ile
 1525 1530 1535
 Glu Pro Val Ser Glu Cys Arg Arg Gly Leu Glu Ser Glu Lys Thr Ser
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 Asn Lys Lys Ile Arg Phe Thr Cys Met Pro Arg His Arg Gln Glu Arg
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 Ser Arg Phe Leu Gln Gly Ser Ser Glu Gln Thr Val Ala Glu Leu Val
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 Asp Phe Pro Val Ser Phe Val Glu Ser Val Lys Ile Pro Thr Ala Cys
 1585 1590 1595 1600
 Val Ala Tyr

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 Arg Tyr Gln Phe Asn Gly His Leu Ser Ala Gly Leu Pro Ile Pro Gly
 35 40 45
 Glu Glu Asn Ser Ala Thr Arg Ile Gln Ser Leu Ile Arg Ile Gln Pro
 50 55 60
 Glu Asn Gly Asp Phe Met Arg Leu Gln Met Thr Lys Thr Arg Phe Ala
 65 70 75 80
 Thr Ser Glu Glu Asp Arg Val Leu Ser Phe Glu Asn Met Asn Glu Val
 85 90 95
 Pro Val Ser Glu Lys Val Glu Lys Val Leu Ser Leu Pro Ile Arg Phe
 100 105 110
 Ser Tyr Arg His Gly Met Val Gly Glu Ile Glu Phe Ser Thr Glu Glu
 115 120 125
 Gln Thr Trp Ser Ser Asn Ile Lys Lys Ala Val Val Asn Met Leu Gln
 130 135 140
 Val Asn Leu Val Lys Lys Gly Met Ser Glu Lys Asn Glu Tyr Glu Thr
 145 150 155 160
 Glu His Asp Asn Asp Phe Phe Leu Ser Asn Glu Arg Thr Leu Glu Gly
 165 170 175

Glu	Cys	Glu	Val	Ala	Tyr	Thr	Lys	Ile	Glu	Lys	Ser	Glu	Lys	Glu	Gln	180	185	190
Gln	Trp	Thr	Lys	Ser	Ile	Asn	Phe	Glu	Lys	Cys	Ser	Leu	Arg	Pro	Glu	195	200	205
Ile	Val	Tyr	Gly	Arg	Arg	Tyr	Ala	Glu	Glu	Cys	Asn	Glu	Cys	Arg	Glu	210	215	220
Arg	Asp	Glu	Lys	Phe	Ser	Ser	Thr	Val	Phe	Phe	Tyr	Asn	Ile	Thr	Gly	225	230	235
Thr	Pro	Glu	Phe	Leu	Ile	Asn	Ser	Val	Glu	Leu	Gln	Ser	Lys	His	Met	245	250	255
Phe	Ala	Pro	Val	Thr	Glu	Gln	Lys	Gln	Leu	Ile	Thr	Ala	Arg	Ile	Thr	260	265	270
Asn	Arg	Leu	Glu	Leu	Val	Tyr	Ser	Gly	Glu	Gln	Lys	Glu	Gln	Ile	Glu	275	280	285
Ala	Val	Arg	Asn	Ser	Asp	Lys	Lys	Glu	Asn	Leu	Leu	Tyr	Asn	Pro	Glu	290	295	300
His	Glu	Ile	Ala	Glu	Glu	Lys	Phe	Ala	Gln	Thr	Gly	Asp	Glu	Glu	Val	305	310	315
Ser	Ser	Ser	Tyr	Ser	Gln	Leu	Arg	Arg	Ser	Gly	Arg	Asn	His	Pro	Ser	325	330	335
Ala	Ala	Glu	Pro	Ser	Leu	Gln	Ala	Asp	Arg	Ala	Asn	Arg	Ala	Arg	Glu	340	345	350
Gln	Pro	Arg	Pro	Arg	Lys	Ile	Leu	Leu	Val	Asn	Tyr	Gln	Pro	Cys	Ile	355	360	365
Gln	Ala	Arg	Leu	Val	Lys	Ser	Leu	Arg	Phe	Ala	Thr	Glu	Asp	Asn	Leu	370	375	380
Ser	Ser	Ile	Arg	Ser	Leu	Val	Ser	Gln	Lys	Ser	Glu	Val	Val	Gln	Ser	385	390	395
Leu	Tyr	Trp	Asp	Ala	Leu	Ala	Ile	Ala	Gly	Thr	Lys	Val	Thr	Val	Ser	405	410	415
His	Leu	Leu	Glu	Lys	Ile	Asn	Asn	Lys	Glu	Ile	Ser	Pro	Met	Lys	Ala	420	425	430
Ser	Gln	Leu	Met	Lys	Ile	Leu	Ala	Glu	Val	Arg	Ile	Pro	Ser	Glu	Gln	435	440	445
Ile	Ala	Gln	Glu	Leu	His	Arg	Phe	Cys	Glu	Ser	Asp	Ile	Val	Ser	Arg	450	455	460
Ser	Ala	Val	Leu	Arg	Gln	Ser	Cys	Trp	Leu	Ser	Tyr	Gly	Ser	Val	Leu	465	470	475
Asn	Gly	Val	Cys	Gly	Gln	Thr	Lys	Asn	Val	Tyr	Gly	Ser	Glu	Ile	Thr	485	490	495

Glu	Thr	Arg	Lys	Gln	Cys	Thr	Arg	Gln	Met	Lys	Glu	Lys	Tyr	Ile	Arg	500	505	510	
Glu	Leu	Ile	Glu	Lys	Met	Asn	Gln	Ala	Glu	Ser	Arg	Tyr	Glu	Lys	Val	515	520	525	
Leu	Phe	Val	Lys	Ala	Ile	Ala	Asn	Ala	Gly	Ile	Asp	Thr	Ser	Val	Val	530	535	540	
Glu	Leu	Glu	Lys	Ile	Ile	Arg	Asn	Gln	Glu	Val	Glu	Lys	Thr	Val	Arg	545	550	555	560
Met	Gln	Ala	Ile	Asp	Ala	Leu	Arg	Arg	Leu	Arg	Leu	Ser	Met	Pro	Lys	565	570	575	
Lys	Ile	Gln	Asn	Val	Leu	Met	Pro	Val	Tyr	Arg	Asn	His	Lys	Glu	Thr	580	585	590	
Pro	Gly	Ile	Arg	Ile	Ser	Ala	Leu	His	Met	Ile	Met	Gln	Thr	Gln	Pro	595	600	605	
Thr	Ser	Gly	Val	Leu	Asp	Met	Ile	Val	Arg	Gly	Leu	Glu	Lys	Glu	Arg	610	615	620	
Ser	Gln	Gln	Val	Arg	Val	Tyr	Thr	Trp	Ser	Thr	Leu	Lys	Thr	Leu	Ser	625	630	635	640
Glu	Ser	Glu	Asn	Pro	Ala	Glu	Lys	Glu	Ile	Arg	Arg	Arg	Val	Ser	Gln	645	650	655	
Ser	Leu	Ala	Ser	Ile	Pro	Val	Glu	Glu	Gln	Lys	Tyr	Leu	Glu	Ser	Lys	660	665	670	
His	Lys	Thr	Phe	Asn	Trp	Phe	Asn	Met	Gln	Ser	Gly	Ala	Thr	Leu	Asn	675	680	685	
Trp	Ala	Thr	Ile	Phe	Ser	Asn	Asp	Ser	Val	Leu	Pro	Lys	Glu	Ile	Thr	690	695	700	
Ala	Ser	Leu	Glu	Thr	Val	Phe	Gly	Gly	Glu	Trp	Asn	Lys	Tyr	Leu	Ala	705	710	715	720
Gln	Ile	Gly	Leu	Tyr	Gln	Asn	Asn	Leu	Asp	Ser	Val	Leu	Ser	Lys	Leu	725	730	735	
Leu	Gln	Lys	Val	Glu	Glu	Thr	Gly	Leu	Glu	Gln	Leu	Val	Val	Arg	Gly	740	745	750	
Lys	Arg	Ser	Ser	Ser	Phe	Phe	Arg	Pro	Ala	Glu	Met	Leu	Arg	Ser	Leu	755	760	765	
Val	Glu	Ser	Leu	Arg	Ile	Ser	His	Arg	Gln	Val	Pro	Ala	Met	Ser	Pro	770	775	780	
Ile	Ala	Met	Ile	Tyr	Leu	Arg	Tyr	Lys	Asp	Gln	Asp	Tyr	Ala	Phe	Leu	785	790	795	800
Pro	Ile	Asp	Ile	Asp	Thr	Leu	Pro	Glu	Met	Ile	Arg	Arg	Val	Ala	Arg	805	810	815	

Asp Gly Gln Leu Asp Leu Ser Glu Ile Glu Lys Val Leu Thr Gln Ala
 820 825 830
 Ala Arg Phe Thr Val Ala Gly Ser Ala Phe Phe His Glu Thr Val Arg
 835 840 845
 Lys Val Pro Ser Ala Leu Gly Met Pro Gln Val Met Thr Ser Lys Met
 850 855 860
 Pro Thr Val Ala Gln Met Asn Gly Glu Val Lys Phe Asp Leu Glu Pro
 865 870 875 880
 Leu Asn Ser Asp Lys Phe Thr Gly Leu Arg Leu Arg Val Lys Ala Glu
 885 890 895
 Pro His Val Ala Ser Thr His Val Cys Lys Leu Glu Leu Phe Thr Pro
 900 905 910
 Ile Gly Gly Gln Gly Ile Lys Leu Leu His Gly Gly Arg Ile Gln Ala
 915 920 925
 Pro Ile Asp Ser Glu Ile Glu Ile Asn Trp Glu Lys Lys Leu Ile Val
 930 935 940
 Lys Ala Thr Ile Lys Ser Pro Glu Gln Lys Arg His Ile Ala His Phe
 945 950 955 960
 Met Thr Arg Pro Val Leu Phe Ser Arg Glu Val Thr Met Asp Lys Gln
 965 970 975
 Met Arg Gln Tyr Pro Glu Pro Arg Glu Lys Thr Ile Gln Leu Arg Glu
 980 985 990
 Asn Arg Phe Pro Ile His Ala Phe Glu Arg Gln Tyr Phe Glu Gln Thr
 995 1000 1005
 Gly Leu Lys Met Thr Val Ser Gly His Tyr Arg Arg Pro Phe Thr Thr
 1010 1015 1020
 Ala Phe Thr Leu Gly Glu Ser Ile Met Met Ser Ser Ser Ser Leu Pro
 1025 1030 1035 1040
 Arg Met Leu Ser Leu Lys Glu Val Val Ala Tyr Met Ser Phe Ser Gly
 1045 1050 1055
 Phe Glu Glu Thr Glu Met Asp Glu Pro Arg Leu Leu Asn Arg Phe Tyr
 1060 1065 1070
 Glu Lys Glu Thr Glu Leu Phe Glu Thr Glu Lys Asn Val Glu Tyr Glu
 1075 1080 1085
 Gln Glu Asp Lys Glu Pro Lys Ser Ser Gln Leu Gln Ser Gln Ile Arg
 1090 1095 1100
 Lys Val Lys Ser Glu Gly Lys Ala Tyr Lys His Arg Val His Met Lys
 1105 1110 1115 1120
 Ile His Thr Val Gly Gly Pro Lys Thr Gln Glu Ala Glu Cys Glu Ile
 1125 1130 1135

Arg Ala Leu Cys Asp Glu Arg Val Arg Phe Cys Arg Leu Asn Leu Asp
 1140 1145 1150
 Ala Ser Arg Ser Pro Ile Gln Gly Glu Ser Arg Gln Trp Gln Leu Lys
 1155 1160 1165
 Ser Ser Ala Glu Trp Leu Tyr Pro Glu Val Pro Ser Thr Met Lys Lys
 1170 1175 1180
 Met Leu Glu Ser Arg Arg Glu Trp Asn Ala Met Trp Thr Gly Lys Trp
 1185 1190 1195 1200
 Gly Ser Glu Lys Gln Asn Glu Val Thr Ile Arg Val Gln Gly Glu Gln
 1205 1210 1215
 Ser Ser Glu Gln Lys Phe Trp Met Lys Lys Ala Glu Arg Glu Gln Ser
 1220 1225 1230
 Pro Leu Thr Ser Gly Gly Gln Ala Ser Arg Ala Ala Gln Leu Asn Gln
 1235 1240 1245
 Tyr Asn Ile His Ala Thr Tyr Glu Val Thr Pro Glu Thr Glu Phe Trp
 1250 1255 1260
 Met Glu Asn Val Tyr Ser Met Phe Lys Thr Tyr Tyr Phe Phe Ser Ala
 1265 1270 1275 1280
 Glu Val Gln Pro Lys Gln Asn Lys Glu Asn Arg Ile Gln Cys Gln Ile
 1285 1290 1295
 Thr Leu Glu Pro Phe Thr Arg Gln Leu Phe Asn Val Thr Val Met Ser
 1300 1305 1310
 Pro Lys Glu Lys Leu Val Leu Glu Leu Glu Asn Gln Gln Thr Pro Phe
 1315 1320 1325
 Arg Leu Pro Ala Val Asn Ile Gly Arg Glu Phe Gly Arg Val Gln Ser
 1330 1335 1340
 Val Arg His Val Val Lys Ala Val Glu Arg Gln Thr Arg Pro Glu Cys
 1345 1350 1355 1360
 Ile Val Lys Ser Lys Glu Ile Gln Thr Phe Asp Glu Val Phe Tyr Arg
 1365 1370 1375
 Thr Pro Val Met Glu Cys Phe Ser Val Leu Ala Lys Asp Cys Ser Glu
 1380 1385 1390
 Asn Pro Asp Phe Ala Val Leu Met Arg Lys Val Ser Lys Arg Gly Glu
 1395 1400 1405
 Glu Lys Met Trp Lys Val Ile Ser Arg Glu Asn Val Ile Glu Leu Glu
 1410 1415 1420
 Lys Lys Ser Glu Glu Met Ser Val Arg Val Asn Gly Lys Glu Ile Ser
 1425 1430 1435 1440
 Glu Asp Lys Trp Glu Asp Phe Gly Ile Ser Gln Arg Gly Glu Glu Lys
 1445 1450 1455

Phe Phe Ile Asp Ala Glu Lys Val Thr Val Glu Phe Asp Gly Phe Gln
1460 1465 1470
Ala Lys Ile Gln Met Ser Ser Leu Tyr Lys Asn Lys Gln Cys Gly Leu
1475 1480 1485
Cys Gly His Tyr Asp Gly Glu Lys Thr Asn Glu Phe Arg Arg Ala Asp
1490 1495 1500
Asn Glu Glu Thr Asp Asp Ile Glu Glu Phe Ser Arg Ser Tyr Leu Ser
1505 1510 1515 1520
Lys Asp Asp Glu Cys Glu Val Asp Glu Gln Glu Met Thr Asn Lys Arg
1525 1530 1535
Asn Tyr Lys Val Leu Arg Glu Glu Thr Ser Ser Ser Glu Glu Ile Ser
1540 1545 1550
Glu Ser Leu Ile Glu Leu Tyr Ser Glu Ala Phe Gln Ser Arg Glu Ala
1555 1560 1565
His His Arg Leu Gly Arg Arg Glu Asp Arg Gln Val Cys Phe Ser Gln
1570 1575 1580
Gln Ala Trp Asn Lys Cys Leu Lys Ser Lys Asp Asn Lys Thr Glu Thr
1585 1590 1595 1600
Lys Asn Val His Phe Lys Cys Leu Thr Glu Thr Thr Arg Ser Pro Arg
1605 1610 1615
Ile Ser Ser Val Phe Ser Gln Ala Asp Ile Ser Glu Asn Leu Ser Asp
1620 1625 1630
Val Glu Gly Leu Pro Ser Leu Ala Glu Pro Ser Pro His Ser Arg Phe
1635 1640 1645
Leu Pro Cys Val Ile Pro Ser Leu Ser Leu Ser Gln
1650 1655 1660

<210> 14
<211> 1687
<212> PRT
<213> Fundulus heteroclitus

<220>
<223> killifish vitellogenin II precursor (Vtg II), yolk
protein precursor

<220>
<221> SIGNAL
<222> (1)..(15)
<223> signal peptide

<220>
<221> PEPTIDE
<222> (16)..(1687)
<223> mature chain

<400> 14

Met	Arg	Val	Leu	Val	Leu	Ala	Leu	Thr	Val	Ala	Leu	Val	Ala	Gly	Asn	1	5	10	15
Gln	Val	Ser	Tyr	Ala	Pro	Glu	Phe	Ala	Pro	Gly	Lys	Thr	Tyr	Glu	Tyr	20	25	30	
Lys	Tyr	Glu	Gly	Tyr	Ile	Leu	Gly	Gly	Leu	Pro	Glu	Glu	Gly	Leu	Ala	35	40	45	
Lys	Ala	Gly	Val	Lys	Ile	Gln	Ser	Lys	Val	Leu	Ile	Gly	Ala	Ala	Gly	50	55	60	
Pro	Asp	Ser	Tyr	Ile	Leu	Lys	Leu	Glu	Asp	Pro	Val	Ile	Ser	Gly	Tyr	65	70	75	80
Ser	Gly	Ile	Trp	Pro	Lys	Glu	Val	Phe	His	Pro	Ala	Thr	Lys	Leu	Thr	85	90	95	
Ser	Ala	Leu	Ser	Ala	Gln	Leu	Leu	Thr	Pro	Val	Lys	Phe	Glu	Tyr	Ala	100	105	110	
Asn	Gly	Val	Ile	Gly	Lys	Val	Phe	Ala	Pro	Pro	Gly	Ile	Ser	Thr	Asn	115	120	125	
Val	Leu	Asn	Val	Phe	Arg	Gly	Leu	Leu	Asn	Met	Phe	Gln	Met	Asn	Ile	130	135	140	
Lys	Lys	Thr	Gln	Asn	Val	Tyr	Asp	Leu	Gln	Glu	Thr	Gly	Val	Lys	Gly	145	150	155	160
Val	Cys	Lys	Thr	His	Tyr	Ile	Leu	His	Glu	Asp	Ser	Lys	Ala	Asp	Arg	165	170	175	
Leu	His	Leu	Thr	Lys	Thr	Thr	Asp	Leu	Asn	His	Cys	Thr	Asp	Ser	Ile	180	185	190	
His	Met	Asp	Val	Gly	Met	Ala	Gly	Tyr	Thr	Glu	Lys	Cys	Ala	Glu	Cys	195	200	205	
Met	Ala	Arg	Gly	Lys	Thr	Leu	Ser	Gly	Ala	Ile	Ser	Val	Asn	Tyr	Ile	210	215	220	
Met	Lys	Pro	Ser	Ala	Ser	Gly	Thr	Leu	Ile	Leu	Glu	Ala	Thr	Ala	Thr	225	230	235	240
Glu	Leu	Leu	Gln	Tyr	Ser	Pro	Val	Asn	Ile	Val	Asn	Gly	Ala	Val	Gln	245	250	255	
Met	Glu	Ala	Lys	Gln	Thr	Val	Thr	Phe	Val	Asp	Ile	Arg	Lys	Thr	Pro	260	265	270	
Leu	Glu	Pro	Leu	Lys	Ala	Asp	Tyr	Ile	Pro	Arg	Gly	Ser	Leu	Lys	Tyr	275	280	285	
Glu	Leu	Gly	Thr	Glu	Phe	Leu	Gln	Thr	Pro	Ile	Gln	Leu	Leu	Arg	Ile	290	295	300	
Thr	Asn	Val	Glu	Ala	Gln	Ile	Val	Glu	Ser	Leu	Asn	Asn	Leu	Val	Ser	305	310	315	320

Leu Asn Met Gly His Ala His Glu Asp Ser Pro Leu Lys Phe Ile Glu
 325 330 335
 Leu Ile Gln Leu Leu Arg Val Ala Lys Tyr Glu Ser Ile Glu Ala Leu
 340 345 350
 Trp Ser Gln Phe Lys Thr Lys Ile Asp His Arg His Trp Leu Leu Ser
 355 360 365
 Ser Ile Pro Ala Ile Gly Thr His Val Ala Leu Lys Phe Ile Lys Glu
 370 375 380
 Lys Ile Val Ala Gly Glu Val Thr Ala Ala Glu Ala Ala Gln Ala Ile
 385 390 395 400
 Met Ser Ser Thr His Leu Val Lys Ala Asp Leu Glu Ala Ile Lys Leu
 405 410 415
 Gln Glu Gly Leu Ala Val Thr Pro Asn Ile Arg Glu Asn Ala Gly Leu
 420 425 430
 Arg Glu Leu Val Met Leu Gly Phe Gly Ile Met Val His Lys Tyr Cys
 435 440 445
 Val Glu Asn Pro Ser Cys Pro Ser Glu Leu Val Arg Pro Val His Asp
 450 455 460
 Ile Ile Ala Lys Ala Leu Glu Lys Arg Asp Asn Asp Glu Leu Ser Leu
 465 470 475 480
 Ala Leu Lys Val Leu Gly Asn Ala Gly His Pro Ser Ser Leu Lys Pro
 485 490 495
 Ile Met Lys Leu Leu Pro Gly Phe Gly Ser Ser Ala Ser Glu Leu Glu
 500 505 510
 Leu Arg Val His Ile Asp Ala Thr Leu Ala Leu Arg Lys Ile Gly Lys
 515 520 525
 Arg Glu Pro Lys Met Ile Gln Asp Val Ala Leu Gln Leu Phe Met Asp
 530 535 540
 Arg Thr Leu Asp Pro Glu Leu Arg Met Val Ala Val Val Val Leu Phe
 545 550 555 560
 Asp Thr Lys Leu Pro Met Gly Leu Ile Thr Thr Leu Ala Gln Ser Leu
 565 570 575
 Leu Lys Glu Pro Asn Leu Gln Val Leu Ser Phe Val Tyr Ser Tyr Met
 580 585 590
 Lys Ala Phe Thr Lys Thr Thr Thr Pro Asp His Ser Thr Val Ala Ala
 595 600 605
 Ala Cys Asn Val Ala Ile Arg Ile Leu Ser Pro Arg Phe Glu Arg Leu
 610 615 620
 Ser Tyr Arg Tyr Ser Arg Ala Phe His Tyr Asp His Tyr His Asn Pro
 625 630 635 640

Trp Met Leu Gly Ala Ala Ala Ser Ala Phe Tyr Ile Asn Asp Ala Ala
 645 650 655
 Thr Val Leu Pro Lys Asn Ile Met Ala Lys Ala Arg Val Tyr Leu Ser
 660 665 670
 Gly Val Ser Val Asp Val Leu Glu Phe Gly Ala Arg Ala Glu Gly Val
 675 680 685
 Gln Glu Ala Leu Leu Lys Ala Arg Asp Val Pro Glu Ser Ala Asp Arg
 690 695 700
 Leu Thr Lys Met Lys Gln Ala Leu Lys Ala Leu Thr Glu Trp Arg Ala
 705 710 715 720
 Asn Pro Ser Arg Gln Pro Leu Gly Ser Leu Tyr Val Lys Val Leu Gly
 725 730 735
 Gln Asp Val Ala Phe Ala Asn Ile Asp Lys Glu Met Val Glu Lys Ile
 740 745 750
 Ile Glu Phe Ala Thr Gly Pro Glu Ile Arg Thr Arg Gly Lys Lys Ala
 755 760 765
 Leu Asp Ala Leu Leu Ser Gly Tyr Ser Met Lys Tyr Ser Lys Pro Met
 770 775 780
 Ser Ala Ile Glu Val Arg His Ile Phe Pro Thr Ser Leu Gly Leu Pro
 785 790 795 800
 Met Glu Leu Ser Leu Tyr Thr Ala Ala Val Thr Ala Ala Ser Val Glu
 805 810 815
 Val Gln Ala Thr Ile Ser Pro Pro Leu Pro Glu Asp Phe His Pro Ala
 820 825 830
 His Leu Leu Lys Ser Asp Ile Ser Met Lys Ala Ser Val Thr Pro Ser
 835 840 845
 Val Ser Leu His Thr Tyr Gly Val Met Gly Val Asn Ser Pro Phe Ile
 850 855 860
 Gln Ala Ser Val Leu Ser Arg Ala Lys Asp His Ala Ala Leu Pro Lys
 865 870 875 880
 Lys Met Glu Ala Arg Leu Asp Ile Val Lys Gly Tyr Phe Ser Tyr Gln
 885 890 895
 Phe Leu Pro Val Glu Gly Val Lys Thr Ile Ala Ser Ala Arg Leu Glu
 900 905 910
 Thr Val Ala Ile Ala Arg Asp Val Glu Gly Leu Ala Ala Ala Lys Val
 915 920 925
 Thr Pro Val Val Pro Tyr Glu Pro Ile Val Ser Lys Asn Ala Thr Leu
 930 935 940
 Asn Leu Ser Gln Met Ser Tyr Tyr Leu Asn Asp Ser Ile Ser Ala Ser
 945 950 955 960

Ser Glu Leu Leu Pro Phe Ser Leu Gln Arg Gln Thr Gly Lys Asn Lys
 965 970 975
 Ile Pro Lys Pro Ile Val Lys Lys Met Cys Ala Thr Thr Tyr Thr Tyr
 980 985 990
 Gly Ile Glu Gly Cys Val Asp Ile Trp Ser Arg Asn Ala Thr Phe Leu
 995 1000 1005
 Arg Asn Thr Pro Ile Tyr Ala Ile Ile Gly Asn His Ser Leu Leu Val
 1010 1015 1020
 Asn Val Thr Pro Ala Ala Gly Pro Ser Ile Glu Arg Ile Glu Ile Glu
 1025 1030 1035 1040
 Val Gln Phe Gly Glu Gln Ala Ala Glu Lys Ile Leu Lys Glu Val Tyr
 1045 1050 1055
 Leu Asn Glu Glu Glu Val Leu Glu Asp Lys Asn Val Leu Met Lys
 1060 1065 1070
 Leu Lys Lys Ile Leu Ser Pro Gly Leu Lys Asn Ser Thr Lys Ala Ser
 1075 1080 1085
 Ser Ser Ser Ser Gly Ser Ser Arg Ser Ser Arg Ser Arg Ser Ser Ser
 1090 1095 1100
 Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Arg Ser Ser Ser Ser
 1105 1110 1115 1120
 Ser Ser Arg Ser Ser Ser Ser Ser Leu Arg Arg Asn Ser Lys Met Leu Asp
 1125 1130 1135
 Leu Ala Asp Pro Leu Asn Ile Thr Ser Lys Arg Ser Ser Ser Ser Ser
 1140 1145 1150
 Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser
 1155 1160 1165
 Ser Lys Thr Lys Trp Gln Leu His Glu Arg Asn Phe Thr Lys Asp His
 1170 1175 1180
 Ile His Gln His Ser Val Ser Lys Glu Arg Leu Asn Ser Lys Ser Ser
 1185 1190 1195 1200
 Ala Ser Ser Phe Glu Ser Ile Tyr Asn Lys Ile Thr Tyr Leu Ser Asn
 1205 1210 1215
 Ile Val Ser Pro Val Val Thr Val Leu Val Arg Ala Ile Arg Ala Asp
 1220 1225 1230
 His Lys Asn Gln Gly Tyr Gln Ile Ala Val Tyr Tyr Asp Lys Leu Thr
 1235 1240 1245
 Thr Arg Val Gln Ile Ile Val Ala Asn Leu Thr Glu Asp Asp Asn Trp
 1250 1255 1260
 Arg Ile Cys Ser Asp Ser Met Met Leu Ser His His Lys Val Met Thr
 1265 1270 1275 1280

Arg Val Thr Trp Gly Ile Gly Cys Lys Gln Tyr Asn Thr Thr Ile Val
 1285 1290 1295
 Ala Glu Thr Gly Arg Val Glu Lys Glu Pro Ala Val Arg Val Lys Leu
 1300 1305 1310
 Ala Trp Ala Arg Leu Pro Thr Tyr Ile Arg Asp Tyr Ala Arg Arg Val
 1315 1320 1325
 Ser Arg Tyr Ile Ser Arg Val Ala Glu Asp Asn Gly Val Asn Arg Thr
 1330 1335 1340
 Lys Val Ala Ser Lys Pro Lys Glu Ile Lys Leu Thr Val Ala Val Ala
 1345 1350 1355 1360
 Asn Glu Thr Ser Leu Asn Val Thr Leu Asn Thr Pro Lys Asn Thr Phe
 1365 1370 1375
 Phe Lys Leu Gly Trp Val Leu Pro Phe Tyr Leu Pro Ile Asn Asn Thr
 1380 1385 1390
 Ala Ala Glu Leu Gln Ala Phe Gln Gly Arg Trp Met Asp Gln Val Thr
 1395 1400 1405
 Tyr Met Leu Thr Lys Ser Ala Ala Ala Glu Cys Thr Val Val Glu Asp
 1410 1415 1420
 Thr Val Val Thr Phe Asn Asn Arg Lys Tyr Lys Thr Glu Thr Pro His
 1425 1430 1435 1440
 Ser Cys His Gln Val Leu Ala Gln Asp Cys Thr Ser Glu Ile Lys Phe
 1445 1450 1455
 Ile Val Leu Leu Lys Arg Asp Gln Thr Ala Glu Arg Asn Glu Ile Ser
 1460 1465 1470
 Ile Lys Ile Glu Asn Ile Asp Val Asp Met Tyr Pro Lys Asp Asn Ala
 1475 1480 1485
 Val Val Val Lys Val Asn Gly Val Glu Ile Pro Leu Thr Asn Leu Pro
 1490 1495 1500
 Tyr Gln His Pro Thr Gly Asn Ile Gln Ile Arg Gln Arg Glu Glu Gly
 1505 1510 1515 1520
 Ile Ser Leu His Ala Pro Ser His Gly Leu Gln Glu Val Phe Leu Ser
 1525 1530 1535
 Leu Asn Lys Val Gln Val Lys Val Val Asp Trp Met Arg Gly Gln Thr
 1540 1545 1550
 Cys Gly Leu Cys Gly Lys Ala Asp Gly Glu Val Arg Gln Glu Tyr Ser
 1555 1560 1565
 Thr Pro Asn Glu Arg Val Ser Arg Asn Ala Thr Ser Phe Ala His Ser
 1570 1575 1580
 Trp Val Leu Pro Ala Lys Ser Cys Arg Asp Ala Ser Glu Cys Tyr Met
 1585 1590 1595 1600

Gln Leu Glu Ser Val Lys Leu Glu Lys Gln Ile Ser Leu Glu Gly Glu
 1605 1610 1615
 Glu Ser Lys Cys Tyr Ser Val Glu Pro Val Trp Arg Cys Leu Pro Gly
 1620 1625 1630
 Cys Ala Pro Val Arg Thr Thr Ser Val Thr Val Gly Leu Pro Cys Val
 1635 1640 1645
 Ser Leu Asp Ser Asn Leu Asn Arg Ser Asp Ser Leu Ser Ser Ile Tyr
 1650 1655 1660
 Gln Lys Ser Val Asp Val Ser Glu Thr Ala Glu Ser His Leu Ala Cys
 1665 1670 1675 1680
 Arg Cys Thr Pro Gln Cys Ala
 1685

<210> 15
 <211> 1659
 <212> PRT
 <213> Oncorhynchus mykiss

<220>
 <223> rainbow trout vitellogenin

<400> 15
 Met Arg Ala Val Val Leu Ala Leu Thr Leu Ala Leu Val Ala Ser Gln
 1 5 10 15
 Ser Val Asn Phe Ala Pro Asp Phe Ala Ala Ser Lys Thr Tyr Val Tyr
 20 25 30
 Lys Tyr Glu Ala Leu Leu Leu Gly Gly Leu Pro Glu Glu Gly Leu Ala
 35 40 45
 Arg Ala Gly Val Lys Val Ile Ser Lys Val Leu Ile Ser Ala Val Ala
 50 55 60
 Glu Asn Thr Tyr Leu Leu Lys Leu Val Asn Pro Glu Ile Phe Glu Tyr
 65 70 75 80
 Ser Gly Val Trp Pro Lys Asp Pro Phe Val Pro Ala Ala Lys Leu Thr
 85 90 95
 Ser Ala Leu Ala Ala Gln Phe Ser Ile Pro Ile Lys Phe Glu Tyr Ala
 100 105 110
 Lys Gly Val Val Gly Lys Val Leu Ala Pro Thr Ala Val Ser Glu Thr
 115 120 125
 Val Leu Asn Val His Arg Gly Ile Leu Asn Ile Leu Gln Leu Asn Ile
 130 135 140
 Lys Lys Thr Gln Asn Val Tyr Glu Leu Gln Glu Ala Gly Ala Gln Gly
 145 150 155 160
 Val Cys Lys Thr His Tyr Val Ile Arg Glu Asp Ala Lys Ala Glu Arg
 165 170 175

Ile	His	Leu	Thr	Lys	Ser	Lys	Asp	Leu	Asn	Asn	Cys	Gln	Gln	Arg	Ile		
			180					185					190				
Met	Lys	Asp	Phe	Gly	Leu	Ala	Tyr	Thr	Glu	Lys	Cys	Val	Glu	Cys	Arg		
		195					200					205					
Gln	Arg	Gly	Glu	Ala	Leu	Met	Gly	Ala	Ala	Thr	Tyr	Asn	Tyr	Leu	Met		
	210					215					220						
Lys	Pro	Ala	Asp	Asn	Gly	Ala	Leu	Ile	Leu	Glu	Ala	Thr	Val	Thr	Glu		
225					230					235					240		
Leu	His	Gln	Phe	Thr	Pro	Phe	Asn	Glu	Met	Ser	Gly	Ala	Ala	Gln	Met		
			245					250						255			
Glu	Ala	Lys	Gln	Met	Leu	Thr	Phe	Val	Glu	Ile	Lys	Lys	Asp	Pro	Ile		
		260					265						270				
Ile	Val	Pro	Asp	Asn	Asn	Tyr	Val	His	Arg	Gly	Ser	Ile	Arg	Tyr	Glu		
	275						280					285					
Phe	Ala	Thr	Glu	Ile	Leu	Gln	Met	Pro	Ile	Gln	Leu	Leu	Lys	Ile	Ser		
	290					295				300							
Asn	Ala	Arg	Ala	Gln	Ala	Val	Lys	Ile	Leu	Asn	His	Leu	Val	Thr	Tyr		
305					310					315					320		
Asn	Thr	Ala	Pro	Val	His	Glu	Asp	Ala	Pro	Leu	Lys	Phe	Leu	Gln	Phe		
			325					330						335			
Ile	Gln	Leu	Leu	Arg	Met	Ala	Ser	Ser	Glu	Thr	Ile	Asn	Ala	Ile	Trp		
		340						345					350				
Ala	Glu	Phe	Lys	Ala	Lys	Pro	Ala	Tyr	Arg	His	Trp	Ile	Leu	Asp	Ala		
		355					360					365					
Val	Pro	Ser	Ile	Gly	Ser	Ser	Val	Ala	Val	Arg	Phe	Ile	Lys	Glu	Lys		
	370					375					380						
Phe	Leu	Ala	Gly	Asp	Ile	Thr	Ile	Phe	Glu	Ala	Ala	Gln	Ala	Leu	Val		
385					390					395					400		
Ala	Ala	Val	His	Met	Val	Ala	Ala	Asp	Leu	Glu	Thr	Val	Lys	Leu	Val		
			405						410					415			
Glu	Ser	Leu	Ala	Phe	Asn	His	Lys	Ile	Gln	Thr	His	Pro	Val	Leu	Arg		
		420						425					430				
Glu	Leu	Thr	Met	Leu	Gly	Tyr	Gly	Thr	Met	Val	Ser	Lys	Tyr	Cys	Val		
	435						440					445					
Glu	His	Pro	Asn	Cys	Pro	Ala	Glu	Leu	Val	Lys	Pro	Ile	His	Glu	Leu		
	450					455					460						
Ala	Val	Gln	Ala	Val	Ala	Asn	Ser	Lys	Phe	Glu	Glu	Leu	Ser	Met	Val		
465					470					475					480		
Leu	Lys	Ala	Leu	Gly	Asn	Ala	Gly	His	Pro	Ala	Ser	Ile	Lys	Pro	Ile		
			485						490					495			

Thr	Lys	Leu	Leu	Pro	Val	Phe	Gly	Thr	Ala	Ala	Ala	Ala	Ala	Leu	Pro	Leu	500	505	510
Arg	Val	Gln	Ala	Asp	Ala	Val	Leu	Ala	Leu	Arg	Asn	Ile	Ala	Lys	Arg	515	520	525	
Glu	Pro	Arg	Met	Val	Gln	Glu	Val	Ala	Val	Gln	Leu	Phe	Met	Asp	Lys	530	535	540	
Ala	Leu	His	Pro	Glu	Leu	Arg	Met	Leu	Ala	Cys	Ile	Val	Leu	Phe	Glu	545	550	555	560
Thr	Lys	Pro	Pro	Met	Gly	Leu	Val	Ile	Thr	Leu	Ala	Ser	Ile	Leu	Lys	565	570	575	
Thr	Glu	Lys	Asn	Met	Gln	Val	Ala	Ser	Phe	Thr	Tyr	Ser	His	Met	Met	580	585	590	
Ser	Leu	Thr	Arg	Ser	Thr	Ala	Pro	Asp	Phe	Ala	Ser	Val	Ala	Ala	Ala	595	600	605	
Cys	Asn	Val	Ala	Val	Lys	Met	Leu	Ser	Asn	Lys	Phe	Arg	Arg	Leu	Ser	610	615	620	
Cys	His	Phe	Ser	Gln	Ala	Ile	His	Leu	Asp	Ala	Tyr	Ser	Asn	Pro	Leu	625	630	635	640
Arg	Ile	Gly	Ala	Ala	Ala	Ser	Ala	Phe	Tyr	Ile	Asn	Asp	Ala	Ala	Thr	645	650	655	
Leu	Phe	Pro	Arg	Thr	Val	Val	Ala	Lys	Ala	Arg	Thr	Tyr	Phe	Ala	Gly	660	665	670	
Ala	Ala	Ala	Asp	Val	Leu	Glu	Val	Gly	Val	Arg	Thr	Glu	Gly	Ile	Gln	675	680	685	
Glu	Ala	Leu	Leu	Lys	Leu	Pro	Pro	Ala	Pro	Glu	Asn	Ala	Asp	Arg	Ile	690	695	700	
Thr	Lys	Met	Arg	Arg	Val	Ile	Lys	Ala	Leu	Ser	Asp	Trp	Arg	Ser	Leu	705	710	715	720
Ala	Thr	Ser	Lys	Pro	Leu	Ala	Ser	Ile	Tyr	Val	Lys	Phe	Phe	Gly	Gln	725	730	735	
Glu	Ile	Ala	Phe	Ala	Asn	Ile	Asp	Lys	Ser	Ile	Ile	Asp	Gln	Ala	Leu	740	745	750	
Gln	Leu	Ala	Asn	Ser	Pro	Ser	Ala	His	Ala	Leu	Gly	Arg	Asn	Ala	Leu	755	760	765	
Lys	Ala	Leu	Leu	Ala	Gly	Ala	Thr	Phe	Gln	Tyr	Val	Lys	Pro	Leu	Leu	770	775	780	
Ala	Ala	Glu	Val	Arg	Arg	Ile	Phe	Pro	Thr	Ala	Val	Gly	Leu	Pro	Met	785	790	795	800
Glu	Leu	Ser	Tyr	Tyr	Thr	Ala	Ala	Val	Ala	Lys	Ala	Tyr	Val	Asn	Val	805	810	815	

Arg	Ala	Thr	Leu	Thr	Pro	Ala	Leu	Pro	Glu	Thr	Phe	His	Ala	Ala	Gln	820	825	830	
Leu	Leu	Lys	Thr	Asn	Ile	Glu	Leu	His	Ala	Glu	Val	Arg	Pro	Ser	Ile	835	840	845	
Val	Met	His	Thr	Phe	Ala	Val	Met	Gly	Val	Asn	Thr	Ala	Phe	Ile	Gln	850	855	860	
Ala	Ala	Ile	Met	Ala	Arg	Ala	Lys	Val	Arg	Thr	Ile	Val	Pro	Ala	Lys	865	870	875	880
Phe	Ala	Ala	Gln	Leu	Asp	Ile	Ala	Asn	Gly	Asn	Phe	Lys	Phe	Glu	Ala	885	890	895	
Phe	Pro	Val	Ser	Pro	Pro	Glu	His	Ile	Ala	Ala	Ala	His	Ile	Glu	Thr	900	905	910	
Phe	Ala	Val	Ala	Arg	Asn	Val	Glu	Asp	Val	Pro	Ala	Glu	Arg	Ile	Thr	915	920	925	
Pro	Leu	Ile	Pro	Ala	Gln	Gly	Val	Ala	Arg	Ser	Thr	Gln	Gln	Ser	Arg	930	935	940	
Asp	Lys	Leu	Thr	Ser	Met	Ile	Ala	Asp	Ser	Ala	Ala	Ser	Phe	Ala	Gly	945	950	955	960
Ser	Leu	Ser	Arg	Ser	Ser	Glu	Ile	Leu	Tyr	Ser	Asp	Leu	Pro	Ser	Asn	965	970	975	
Phe	Lys	Pro	Ile	Ile	Lys	Ala	Ile	Val	Val	His	Leu	Glu	Glu	Thr	Ile	980	985	990	
Cys	Val	Glu	Arg	Leu	Gly	Val	Lys	Ala	Cys	Phe	Glu	Phe	Thr	Ser	Glu	995	1000	1005	
Ser	Ala	Ala	Phe	Ile	Arg	Asn	Thr	Leu	Phe	Tyr	Asn	Met	Ile	Gly	Lys	1010	1015	1020	
His	Ser	Val	Leu	Ile	Ser	Val	Lys	Pro	Ser	Ala	Ser	Glu	Pro	Ala	Ile	1025	1030	1035	1040
Glu	Arg	Leu	Glu	Phe	Glu	Val	Gln	Val	Gly	Pro	Lys	Ala	Ala	Glu	Lys	1045	1050	1055	
Ile	Ile	Lys	Val	Ile	Thr	Met	Asn	Glu	Glu	Glu	Glu	Ala	Pro	Glu	Gly	1060	1065	1070	
Lys	Thr	Val	Leu	Leu	Lys	Leu	Lys	Lys	Ile	Leu	Leu	Pro	Asp	Leu	Lys	1075	1080	1085	
Asn	Gly	Thr	Arg	Ala	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	1090	1095	1100	
Ser	Arg	Ser	Ser	Ser	Ser	Arg	Ser	Arg	Ser	Arg	Lys	Ser	Glu	Ser	Ser	1105	1110	1115	1120
Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Arg	Ile	Ser	Lys	Arg	Asp	Gly	Pro	1125	1130	1135	

Asp Gln Pro Tyr Asn Pro Asn Asp Arg Lys Phe Lys Lys Asn His Lys
 1140 1145 1150
 Asp Ser Gln Ser Thr Ser Asn Val Ile Ser Arg Ser Lys Ser Ser Ala
 1155 1160 1165
 Ser Ser Phe His Ala Ile Tyr Lys Gln Asp Lys Phe Leu Gly Asn Lys
 1170 1175 1180
 Leu Ala Pro Met Val Ile Ile Leu Phe Arg Leu Val Arg Ala Asp His
 1185 1190 1195 1200
 Lys Ile Glu Gly Tyr Gln Val Thr Ala Tyr Leu Asn Lys Ala Thr Ser
 1205 1210 1215
 Arg Leu Gln Ile Ile Met Ala Ala Leu Asp Glu Asn Asp Asn Trp Lys
 1220 1225 1230
 Leu Cys Ala Asp Gly Val Leu Leu Ser Lys His Lys Val Thr Ala Lys
 1235 1240 1245
 Ile Ala Trp Gly Ala Glu Cys Lys Asp Tyr Asn Thr Phe Ile Thr Ala
 1250 1255 1260
 Glu Thr Gly Leu Val Gly Pro Ser Pro Ala Val Arg Leu Arg Leu Ser
 1265 1270 1275 1280
 Trp Asp Lys Leu Pro Lys Val Pro Lys Ala Val Trp Arg Tyr Val Arg
 1285 1290 1295
 Ile Val Ser Glu Phe Ile Pro Gly Tyr Ile Pro Tyr Tyr Leu Ala Asp
 1300 1305 1310
 Leu Val Pro Met Gln Lys Asp Lys Asn Asn Glu Lys Gln Ile Gln Phe
 1315 1320 1325
 Thr Val Val Ala Thr Ser Glu Arg Thr Leu Asp Val Ile Leu Lys Thr
 1330 1335 1340
 Pro Lys Met Thr Leu Tyr Lys Leu Gly Val Asn Leu Pro Cys Ser Leu
 1345 1350 1355 1360
 Pro Phe Glu Ser Met Thr Asp Leu Ser Pro Phe Asp Asp Asn Ile Val
 1365 1370 1375
 Asn Lys Ile His Tyr Leu Phe Ser Glu Val Asn Ala Val Lys Cys Ser
 1380 1385 1390
 Met Val Arg Asp Thr Leu Thr Thr Phe Asn Asn Lys Lys Tyr Lys Ile
 1395 1400 1405
 Asn Met Pro Leu Ser Cys Tyr Gln Val Leu Ala Gln Asp Cys Thr Thr
 1410 1415 1420
 Glu Leu Lys Phe Met Val Leu Leu Lys Lys Asp His Ala Ser Glu Gln
 1425 1430 1435 1440
 Asn His Ile Asn Val Lys Ile Ser Asp Ile Asp Val Asp Leu Tyr Thr
 1445 1450 1455

Glu Asp His Gly Val Ile Val Lys Val Asn Glu Met Glu Ile Ser Asn
 1460 1465 1470
 Asp Asn Leu Pro Tyr Lys Asp Pro Ser Gly Ser Ile Lys Ile Asp Arg
 1475 1480 1485
 Lys Gly Lys Gly Val Ser Leu Tyr Ala Pro Ser His Gly Leu Gln Glu
 1490 1495 1500
 Val Tyr Phe Asp Lys Tyr Ser Trp Lys Ile Lys Val Val Asp Trp Met
 1505 1510 1515 1520
 Lys Gly Gln Thr Cys Gly Leu Cys Gly Lys Ala Asp Gly Glu Asn Arg
 1525 1530 1535
 Gln Glu Tyr Arg Thr Pro Ser Gly Arg Leu Thr Lys Ser Ser Val Ser
 1540 1545 1550
 Phe Ala His Ser Trp Val Leu Pro Ser Asp Ser Cys Arg Asp Ala Ser
 1555 1560 1565
 Glu Cys Leu Met Lys Leu Glu Ser Val Lys Leu Glu Lys Gln Val Ile
 1570 1575 1580
 Val Asp Asp Arg Glu Ser Lys Cys Tyr Ser Val Glu Pro Val Leu Arg
 1585 1590 1595 1600
 Cys Leu Pro Gly Cys Leu Pro Val Arg Thr Thr Pro Ile Thr Ile Gly
 1605 1610 1615
 Phe His Cys Leu Pro Val Asp Ser Asn Leu Asn Arg Ser Glu Gly Leu
 1620 1625 1630
 Ser Ser Ile Tyr Glu Lys Ser Val Asp Leu Met Glu Lys Ala Glu Ala
 1635 1640 1645
 His Val Ala Cys Arg Cys Ser Glu Gln Cys Met
 1650 1655

<210> 16
 <211> 1704
 <212> PRT
 <213> Fundulus heteroclitus

<220>
 <223> killifish vitellogenin 1 precursor (Vtg I), yolk
 protein precursor

<400> 16
 Met Lys Ala Val Val Leu Ala Leu Thr Leu Ala Phe Val Ala Gly Gln
 1 5 10 15
 Asn Phe Ala Pro Glu Phe Ala Ala Gly Lys Thr Tyr Val Tyr Lys Tyr
 20 25 30
 Glu Ala Leu Ile Leu Gly Gly Leu Pro Glu Glu Gly Leu Ala Arg Ala
 35 40 45
 Gly Leu Lys Ile Ser Thr Lys Leu Leu Leu Ser Ala Ala Asp Gln Asn
 50 55 60

Thr	Tyr	Met	Leu	Lys	Leu	Val	Glu	Pro	Glu	Leu	Ser	Glu	Tyr	Ser	Gly	65	70	75	80
Ile	Trp	Pro	Lys	Asp	Pro	Ala	Val	Pro	Ala	Thr	Lys	Leu	Thr	Ala	Ala		85	90	95
Leu	His	Leu	Ser	Ser	Gln	Phe	Pro	Ser	Ser	Leu	Asn	Thr	Pro	Met	Val		100	105	110
Phe	Val	Gly	Lys	Val	Phe	Ala	Pro	Glu	Glu	Val	Ser	Thr	Leu	Val	Leu		115	120	125
Asn	Ile	Tyr	Arg	Gly	Ile	Leu	Asn	Ile	Leu	Gln	Leu	Asn	Ile	Lys	Lys		130	135	140
Thr	His	Lys	Val	Tyr	Asp	Leu	Gln	Glu	Val	Gly	Thr	Gln	Gly	Val	Cys		145	150	155
Lys	Thr	Leu	Tyr	Ser	Ile	Ser	Glu	Asp	Ala	Arg	Ile	Glu	Asn	Ile	Leu		165	170	175
Leu	Thr	Lys	Thr	Arg	Asp	Leu	Ser	Asn	Cys	Gln	Glu	Arg	Leu	Asn	Lys		180	185	190
Asp	Ile	Gly	Leu	Ala	Tyr	Thr	Glu	Lys	Cys	Asp	Lys	Cys	Gln	Glu	Glu		195	200	205
Thr	Lys	Asn	Leu	Arg	Gly	Thr	Thr	Thr	Leu	Ser	Tyr	Val	Leu	Lys	Pro		210	215	220
Val	Ala	Asp	Ala	Val	Met	Ile	Leu	Lys	Ala	Tyr	Val	Asn	Glu	Leu	Ile		225	230	235
Gln	Phe	Ser	Pro	Phe	Ser	Glu	Ala	Asn	Gly	Ala	Ala	Gln	Met	Arg	Thr		245	250	255
Lys	Gln	Ser	Leu	Glu	Phe	Leu	Glu	Ile	Glu	Lys	Glu	Pro	Ile	Pro	Ser		260	265	270
Val	Lys	Ala	Glu	Tyr	Arg	His	Arg	Gly	Ser	Leu	Lys	Tyr	Glu	Phe	Ser		275	280	285
Asp	Glu	Leu	Leu	Gln	Thr	Pro	Leu	Gln	Leu	Ile	Lys	Ile	Ser	Asp	Ala		290	295	300
Pro	Ala	Gln	Val	Ala	Glu	Val	Leu	Lys	His	Leu	Ala	Thr	Tyr	Asn	Ile		305	310	315
Glu	Asp	Val	His	Glu	Asn	Ala	Pro	Leu	Lys	Phe	Leu	Glu	Leu	Val	Gln		325	330	335
Leu	Leu	Arg	Ile	Ala	Arg	Tyr	Glu	Asp	Leu	Glu	Met	Tyr	Trp	Asn	Gln		340	345	350
Tyr	Lys	Lys	Met	Ser	Pro	His	Arg	His	Trp	Phe	Leu	Asp	Thr	Ile	Pro		355	360	365
Ala	Thr	Gly	Thr	Phe	Ala	Gly	Leu	Arg	Phe	Ile	Lys	Glu	Lys	Phe	Met		370	375	380

Ala	Glu	Glu	Ile	Thr	Ile	Ala	Glu	Ala	Ala	Gln	Ala	Phe	Ile	Thr	Ala	385	390	395	400
Val	His	Met	Val	Thr	Ala	Asp	Pro	Glu	Val	Ile	Lys	Leu	Phe	Glu	Ser	405	410	415	
Leu	Val	Asp	Ser	Asp	Lys	Val	Val	Glu	Asn	Pro	Leu	Leu	Arg	Glu	Val	420	425	430	
Val	Phe	Leu	Gly	Tyr	Gly	Thr	Met	Val	Asn	Lys	Tyr	Cys	Asn	Lys	Thr	435	440	445	
Val	Asp	Cys	Pro	Val	Glu	Leu	Ile	Lys	Pro	Ile	Gln	Gln	Arg	Leu	Ser	450	455	460	
Asp	Ala	Ile	Ala	Lys	Asn	Glu	Glu	Glu	Asn	Ile	Ile	Leu	Tyr	Ile	Lys	465	470	475	480
Val	Leu	Gly	Asn	Ala	Gly	His	Pro	Ser	Ser	Phe	Lys	Ser	Leu	Thr	Lys	485	490	495	
Ile	Met	Pro	Ile	His	Gly	Thr	Ala	Ala	Val	Ser	Leu	Pro	Met	Thr	Ile	500	505	510	
His	Val	Glu	Ala	Ile	Met	Ala	Leu	Arg	Asn	Ile	Ala	Lys	Lys	Glu	Ser	515	520	525	
Arg	Met	Val	Gln	Glu	Leu	Ala	Leu	Gln	Leu	Tyr	Met	Asp	Lys	Ala	Leu	530	535	540	
His	Pro	Glu	Leu	Arg	Met	Leu	Ser	Cys	Ile	Val	Leu	Phe	Glu	Thr	Ser	545	550	555	560
Pro	Ser	Met	Gly	Leu	Val	Thr	Thr	Val	Ala	Asn	Ser	Val	Lys	Thr	Glu	565	570	575	
Glu	Asn	Leu	Gln	Val	Ala	Ser	Phe	Thr	Tyr	Ser	His	Met	Lys	Ser	Leu	580	585	590	
Ser	Arg	Ser	Pro	Ala	Thr	Ile	His	Pro	Asp	Val	Ala	Ala	Ala	Cys	Ser	595	600	605	
Ala	Ala	Met	Lys	Ile	Leu	Gly	Thr	Lys	Leu	Asp	Arg	Leu	Ser	Leu	Arg	610	615	620	
Tyr	Ser	Lys	Ala	Val	His	Val	Asp	Leu	Tyr	Asn	Ser	Ser	Leu	Ala	Val	625	630	635	640
Gly	Ala	Ala	Ala	Thr	Ala	Phe	Tyr	Ile	Asn	Asp	Ala	Ala	Thr	Phe	Met	645	650	655	
Pro	Lys	Ser	Phe	Val	Ala	Lys	Thr	Lys	Gly	Phe	Ile	Ala	Gly	Ser	Thr	660	665	670	
Ala	Glu	Val	Leu	Glu	Ile	Gly	Ala	Asn	Ile	Glu	Gly	Leu	Gln	Glu	Leu	675	680	685	
Ile	Leu	Lys	Asn	Pro	Ala	Leu	Ser	Glu	Ser	Thr	Asp	Arg	Ile	Thr	Lys	690	695	700	

Met	Lys	Arg	Val	Ile	Lys	Ala	Leu	Ser	Glu	Trp	Arg	Ser	Leu	Pro	Thr	705	710	715	720
Ser	Lys	Pro	Leu	Ala	Ser	Val	Tyr	Val	Lys	Phe	Phe	Gly	Gln	Glu	Ile	725	730	735	
Gly	Phe	Ala	Asn	Ile	Asp	Lys	Pro	Met	Ile	Asp	Lys	Ala	Val	Lys	Phe	740	745	750	
Gly	Lys	Glu	Leu	Pro	Ile	Gln	Glu	Tyr	Gly	Arg	Glu	Ala	Leu	Lys	Ala	755	760	765	
Leu	Leu	Leu	Ser	Gly	Ile	Asn	Phe	His	Tyr	Ala	Lys	Pro	Val	Leu	Ala	770	775	780	
Ala	Glu	Met	Arg	Arg	Ile	Leu	Pro	Thr	Val	Ala	Gly	Ile	Pro	Met	Glu	785	790	795	800
Leu	Ser	Leu	Tyr	Ser	Ala	Ala	Val	Ala	Ala	Ala	Ser	Val	Glu	Ile	Lys	805	810	815	
Pro	Asn	Thr	Ser	Pro	Arg	Leu	Ser	Ala	Asp	Phe	Asp	Val	Lys	Thr	Leu	820	825	830	
Leu	Glu	Thr	Asp	Val	Glu	Leu	Lys	Ala	Glu	Ile	Arg	Pro	Met	Val	Ala	835	840	845	
Met	Asp	Thr	Tyr	Ala	Val	Met	Gly	Leu	Asn	Thr	Asp	Ile	Phe	Gln	Ala	850	855	860	
Ala	Leu	Val	Ala	Arg	Ala	Lys	Leu	His	Ser	Val	Val	Pro	Ala	Lys	Ile	865	870	875	880
Ala	Ala	Arg	Leu	Asn	Ile	Lys	Glu	Gly	Asp	Phe	Lys	Leu	Glu	Ala	Leu	885	890	895	
Pro	Val	Asp	Val	Pro	Glu	Asn	Ile	Thr	Ser	Met	Asn	Val	Thr	Thr	Phe	900	905	910	
Ala	Val	Ala	Arg	Asn	Ile	Glu	Glu	Pro	Leu	Val	Glu	Arg	Ile	Thr	Pro	915	920	925	
Leu	Leu	Pro	Thr	Lys	Val	Leu	Val	Pro	Ile	Pro	Ile	Arg	Arg	His	Thr	930	935	940	
Ser	Lys	Leu	Asp	Pro	Thr	Arg	Asn	Ser	Met	Leu	Asp	Ser	Ser	Glu	Leu	945	950	955	960
Leu	Pro	Met	Glu	Glu	Glu	Asp	Val	Glu	Pro	Ile	Pro	Glu	Tyr	Lys	Phe	965	970	975	
Arg	Arg	Phe	Ala	Lys	Lys	Tyr	Cys	Ala	Lys	His	Ile	Gly	Val	Gly	Leu	980	985	990	
Lys	Ala	Cys	Phe	Lys	Phe	Ala	Ser	Gln	Asn	Gly	Ala	Ser	Ile	Gln	Asp	995	1000	1005	
Ile	Val	Leu	Tyr	Lys	Leu	Ala	Gly	Ser	His	Asn	Phe	Ser	Phe	Ser	Val	1010	1015	1020	

Thr Pro Ile Glu Gly Glu Val Val Glu Arg Leu Glu Met Glu Val Lys
 1025 1030 1035 1040
 Val Gly Ala Lys Ala Ala Glu Lys Leu Val Lys Arg Ile Asn Leu Ser
 1045 1050 1055
 Glu Asp Glu Glu Thr Glu Glu Gly Gly Pro Val Leu Val Lys Leu Asn
 1060 1065 1070
 Lys Ile Leu Ser Ser Arg Arg Asn Ser Ser Ser Ser Ser Ser Ser Ser
 1075 1080 1085
 Ser Ser Ser Ser Ser Glu Ser Arg Ser Ser Arg Ser Ser Ser Ser Ser
 1090 1095 1100
 Ser Ser Ser Ser Arg Ser Ser Arg Lys Ile Asp Leu Ala Ala Arg Thr
 1105 1110 1115 1120
 Asn Ser Ser Ser Ser Ser Ser Ser Arg Arg Ser Arg Ser Ser Ser Ser
 1125 1130 1135
 Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser
 1140 1145 1150
 Arg Arg Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Arg
 1155 1160 1165
 Ser Ser Arg Arg Val Asn Ser Thr Arg Ser Ser Ser Ser Ser Ser Arg
 1170 1175 1180
 Thr Ser Ser Ala Ser Ser Leu Ala Ser Phe Phe Ser Asp Ser Ser Ser
 1185 1190 1195 1200
 Ser Ser Ser Ser Ser Asp Arg Arg Ser Lys Glu Val Met Glu Lys Phe
 1205 1210 1215
 Gln Arg Leu His Lys Lys Met Val Ala Ser Gly Ser Ser Ala Ser Ser
 1220 1225 1230
 Val Glu Ala Ile Tyr Lys Glu Lys Lys Tyr Leu Gly Glu Glu Glu Ala
 1235 1240 1245
 Val Val Ala Val Ile Leu Arg Ala Val Lys Ala Asp Lys Arg Met Val
 1250 1255 1260
 Gly Tyr Gln Leu Gly Phe Tyr Leu Asp Lys Pro Asn Ala Arg Val Gln
 1265 1270 1275 1280
 Ile Ile Val Ala Asn Ile Ser Ser Asp Ser Asn Trp Arg Ile Cys Ala
 1285 1290 1295
 Asp Ala Val Val Leu Ser Lys His Lys Val Thr Thr Lys Ile Ser Trp
 1300 1305 1310
 Gly Glu Gln Cys Arg Lys Tyr Ser Thr Asn Val Thr Gly Glu Thr Gly
 1315 1320 1325
 Ile Val Ser Ser Ser Pro Ala Ala Arg Leu Arg Val Ser Trp Glu Arg
 1330 1335 1340

Leu Pro Ser Thr Leu Lys Arg Tyr Gly Lys Met Val Asn Lys Tyr Val
 1345 1350 1355 1360
 Pro Val Lys Ile Leu Ser Asp Leu Ile His Thr Lys Arg Glu Asn Ser
 1365 1370 1375
 Thr Arg Asn Ile Ser Val Ile Ala Val Ala Thr Ser Glu Lys Thr Ile
 1380 1385 1390
 Asp Ile Ile Thr Lys Thr Pro Met Ser Ser Val Tyr Asn Val Thr Met
 1395 1400 1405
 His Leu Pro Met Cys Ile Pro Ile Asp Glu Ile Lys Gly Leu Ser Pro
 1410 1415 1420
 Phe Asp Glu Val Ile Asp Lys Ile His Phe Met Val Ser Lys Ala Ala
 1425 1430 1435 1440
 Ala Ala Glu Cys Ser Phe Val Glu Asp Thr Leu Tyr Thr Phe Asn Asn
 1445 1450 1455
 Arg Ser Tyr Lys Asn Lys Met Pro Ser Ser Cys Tyr Gln Val Ala Ala
 1460 1465 1470
 Gln Asp Cys Thr Asp Glu Leu Lys Phe Met Val Leu Leu Arg Lys Asp
 1475 1480 1485
 Ser Ser Glu Gln His His Ile Asn Val Lys Ile Ser Glu Ile Asp Ile
 1490 1495 1500
 Asp Met Phe Pro Lys Asp Asp Asn Val Thr Val Lys Val Asn Glu Met
 1505 1510 1515 1520
 Glu Ile Pro Pro Pro Ala Cys Leu Thr Ala Thr Gln Gln Leu Pro Leu
 1525 1530 1535
 Lys Ile Lys Thr Lys Arg Arg Gly Leu Ala Val Tyr Ala Pro Ser His
 1540 1545 1550
 Gly Leu Gln Glu Val Tyr Phe Asp Arg Lys Thr Trp Arg Ile Lys Val
 1555 1560 1565
 Ala Asp Trp Met Lys Gly Lys Thr Cys Gly Leu Cys Gly Lys Ala Asp
 1570 1575 1580
 Gly Glu Ile Arg Gln Glu Tyr His Thr Pro Asn Gly Arg Val Ala Lys
 1585 1590 1595 1600
 Asn Ser Ile Ser Phe Ala His Ser Trp Ile Leu Pro Ala Glu Ser Cys
 1605 1610 1615
 Arg Asp Ala Ser Glu Cys Arg Leu Lys Leu Glu Ser Val Gln Leu Glu
 1620 1625 1630
 Lys Gln Leu Thr Ile His Gly Glu Asp Ser Thr Cys Phe Ser Val Glu
 1635 1640 1645
 Pro Val Pro Arg Cys Leu Pro Gly Cys Leu Pro Val Lys Thr Thr Pro
 1650 1655 1660

Val Thr Val Gly Phe Ser Cys Leu Ala Ser Asp Pro Gln Thr Ser Val
 1665 1670 1675 1680

Tyr Asp Arg Ser Val Asp Leu Arg Gln Thr Thr Gln Ala His Leu Ala
 1685 1690 1695

Cys Ser Cys Asn Thr Lys Cys Ser
 1700

<210> 17
 <211> 1677
 <212> PRT
 <213> Acipenser transmontanus

<220>
 <223> white sturgeon vitellogenin, egg yolk protein
 precursor

<220>
 <221> SIGNAL
 <222> (1)..(8)
 <223> signal peptide

<220>
 <221> PEPTIDE
 <222> (9)..(1677)
 <223> mature peptide

<220>
 <221> PEPTIDE
 <222> (9)..(1081)
 <223> lipovitellin I

<220>
 <221> PEPTIDE
 <222> (1097)..(1273)
 <223> phosvitin

<220>
 <221> PEPTIDE
 <222> (1274)..(1677)
 <223> lipovitellin II

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Phe Ser Gly Ser Lys Thr Tyr Gln Tyr Lys Tyr Glu Gly Val Ile Leu
 20 25 30

Thr Gly Leu Pro Glu Lys Gly Leu Ala Arg Ala Gly Leu Lys Val His
 35 40 45

Cys Lys Val Glu Ile Ser Glu Val Ala Gln Lys Thr Tyr Leu Leu Lys
 50 55 60

Ile Leu Asn Pro Glu Ile Gln Glu Tyr Asn Gly Ile Trp Pro Lys Ala
 65 70 75 80

Pro	Phe	Tyr	Pro	Ala	Ser	Lys	Leu	Thr	Gln	Ala	Leu	Ala	Ser	Gln	Leu	85	90	95
Thr	Gln	Pro	Ile	Lys	Phe	Gln	Tyr	Arg	Asn	Gly	Gln	Val	Gly	Asp	Ile	100	105	110
Phe	Ala	Ser	Glu	Asp	Val	Ser	Asp	Thr	Val	Leu	Asn	Ile	Gln	Arg	Gly	115	120	125
Ile	Leu	Asn	Met	Leu	Gln	Leu	Thr	Ile	Lys	Thr	Thr	Gln	Asn	Val	Tyr	130	135	140
Gly	Leu	Gln	Glu	Asn	Gly	Ile	Ala	Gly	Ile	Cys	Glu	Ala	Ser	Tyr	Val	145	150	155
Ile	Gln	Glu	Asp	Arg	Lys	Ala	Asn	Lys	Ile	Ile	Val	Thr	Lys	Ser	Lys	165	170	175
Asp	Leu	Asn	Asn	Cys	Asn	Glu	Lys	Ile	Lys	Met	Asp	Ile	Gly	Met	Ala	180	185	190
Tyr	Ser	His	Thr	Cys	Ser	Asn	Cys	Arg	Lys	Ile	Arg	Lys	Asn	Thr	Arg	195	200	205
Gly	Thr	Ala	Ala	Tyr	Thr	Tyr	Ile	Leu	Lys	Pro	Thr	Asp	Thr	Gly	Thr	210	215	220
Leu	Ile	Thr	Gln	Ala	Thr	Ser	Gln	Glu	Val	His	Gln	Leu	Thr	Pro	Phe	225	230	235
Asn	Glu	Met	Thr	Gly	Ala	Ala	Ile	Thr	Glu	Ala	Arg	Gln	Lys	Leu	Val	245	250	255
Leu	Glu	Asp	Ala	Lys	Val	Ile	His	Val	Thr	Val	Pro	Glu	Gln	Glu	Leu	260	265	270
Lys	Asn	Arg	Gly	Ser	Ile	Gln	Tyr	Gln	Phe	Ala	Ser	Glu	Ile	Leu	Gln	275	280	285
Thr	Pro	Ile	Gln	Leu	Phe	Lys	Thr	Arg	Ser	Pro	Glu	Thr	Lys	Ile	Lys	290	295	300
Glu	Val	Leu	Gln	His	Leu	Val	Gln	Asn	Asn	Gln	Gln	Gln	Val	Gln	Ser	305	310	315
Asp	Ala	Pro	Ser	Lys	Phe	Leu	Gln	Leu	Thr	Gln	Leu	Leu	Arg	Ala	Cys	325	330	335
Thr	His	Glu	Asn	Ile	Glu	Gly	Ile	Trp	Arg	Gln	Tyr	Glu	Lys	Thr	Gln	340	345	350
Leu	Tyr	Arg	Arg	Trp	Ile	Leu	Asp	Ala	Leu	Pro	Ala	Ala	Ala	Thr	Pro	355	360	365
Thr	Ala	Phe	Arg	Phe	Ile	Thr	Gln	Arg	Ile	Met	Lys	Arg	Asp	Leu	Thr	370	375	380
Asp	Ala	Glu	Ala	Ile	Gln	Thr	Leu	Val	Thr	Ala	Met	His	Leu	Val	Gln	385	390	395

Thr	Asn	His	Gln	Ile	Val	Gln	Met	Ala	Ala	Glu	Leu	Val	Phe	Asp	Arg	
				405					410					415		
Ala	Asn	Leu	Lys	Cys	Pro	Val	Leu	Arg	Lys	His	Ala	Val	Leu	Ala	Tyr	
			420					425					430			
Gly	Ser	Met	Val	Asn	Arg	Tyr	Cys	Ala	Glu	Thr	Leu	Asn	Cys	Arg	Glu	
		435					440					445				
Glu	Ala	Leu	Lys	Pro	Leu	His	Asp	Phe	Ala	Asn	Asp	Ala	Ile	Ser	Arg	
	450					455					460					
Ala	His	Glu	Glu	Glu	Thr	Val	Leu	Ala	Leu	Lys	Ala	Leu	Gly	Asn	Ala	
465					470					475					480	
Gly	Gln	Pro	Ser	Ser	Ile	Lys	Arg	Ile	Gln	Lys	Cys	Leu	Pro	Gly	Phe	
				485					490					495		
Ser	Ser	Gly	Ala	Ser	Gln	Leu	Pro	Val	Lys	Ile	Gln	Val	Asp	Ala	Val	
			500					505					510			
Met	Ala	Leu	Arg	Asn	Ile	Ala	Lys	Lys	Glu	Pro	Gly	Lys	Val	Gln	Glu	
		515					520					525				
Leu	Thr	Met	Gln	Leu	Phe	Met	Asp	His	Gln	Leu	His	Ser	Glu	Val	Arg	
	530					535					540					
Met	Val	Ala	Ser	Met	Val	Leu	Leu	Glu	Thr	Arg	Pro	Ser	Met	Ala	Leu	
545					550					555					560	
Val	Ala	Thr	Leu	Ala	Glu	Ala	Leu	Leu	Lys	Glu	Thr	Ser	Leu	Gln	Val	
				565					570					575		
Ala	Ser	Phe	Thr	Tyr	Ser	His	Met	Lys	Ala	Ile	Thr	Arg	Ser	Thr	Ala	
			580					585					590			
Pro	Glu	Asn	His	Ala	Leu	Ser	Ser	Ala	Cys	Asn	Val	Ala	Val	Lys	Leu	
		595					600					605				
Leu	Ser	Arg	Lys	Leu	Asp	Arg	Leu	Ser	Tyr	Arg	Tyr	Ser	Lys	Ala	Met	
		610				615					620					
His	Met	Asp	Thr	Phe	Lys	Tyr	Pro	Leu	Met	Ala	Gly	Ala	Ala	Ala	Asn	
625					630					635					640	
Ile	His	Ile	Ile	Asn	Asn	Ala	Ala	Ser	Ile	Leu	Pro	Ser	Ala	Val	Val	
				645					650					655		
Met	Lys	Phe	Gln	Ala	Tyr	Ile	Leu	Ser	Ala	Thr	Ala	Asp	Pro	Leu	Glu	
			660					665					670			
Ile	Gly	Leu	His	Thr	Glu	Gly	Leu	Gln	Glu	Val	Leu	Met	Gln	Asn	His	
		675					680					685				
Glu	His	Ile	Asp	Gln	Met	Pro	Ser	Ala	Gly	Lys	Ile	Gln	Gln	Ile	Met	
	690					695					700					
Lys	Met	Leu	Ser	Gly	Trp	Lys	Ser	Val	Pro	Ser	Glu	Lys	Thr	Leu	Ala	
705					710					715					720	

Ser Ala Tyr Ile Lys Leu Phe Gly Gln Glu Ile Ser Phe Ser Arg Leu
 725 730 735
 Asp Lys Lys Thr Ile Gln Glu Ala Leu Gln Ala Val Arg Glu Pro Val
 740 745 750
 Glu Arg Gln Thr Val Ile Lys Arg Val Val Asn Gln Leu Glu Arg Gly
 755 760 765
 Ala Ala Ala Gln Leu Ser Lys Pro Leu Leu Val Ala Glu Val Arg Arg
 770 775 780
 Ile Leu Pro Thr Cys Ile Gly Leu Pro Met Glu Met Ser Leu Tyr Val
 785 790 795 800
 Ser Ala Val Thr Thr Ala Asp Ile Asn Val Gln Ala His Ile Thr Pro
 805 810 815
 Ser Pro Thr Asn Asp Phe Asn Val Ala Gln Leu Leu Asn Ser Asn Ile
 820 825 830
 Val Leu His Thr Asp Val Thr Pro Ser Ile Ala Met His Thr Ile Ala
 835 840 845
 Val Met Gly Ile Asn Thr His Val Ile Gln Thr Gly Val Glu Leu His
 850 855 860
 Val Lys Ala Arg Thr Thr Val Pro Met Lys Phe Thr Ala Lys Ile Asp
 865 870 875 880
 Leu Lys Glu Lys Asn Phe Lys Ile Glu Ser Glu Pro Cys Gln Gln Glu
 885 890 895
 Thr Glu Val Leu Ser Leu Ser Ala Gln Ala Phe Ala Ile Ser Arg Asn
 900 905 910
 Val Glu Asp Leu Asp Ala Ala Lys Lys Asn Pro Leu Leu Pro Glu Glu
 915 920 925
 Ala Val Arg Asn Ile Leu Asn Glu Gln Phe Asn Ser Gly Thr Glu Asp
 930 935 940
 Ser Asn Glu Arg Glu Arg Ala Gly Lys Phe Ala Arg Pro Ser Ala Glu
 945 950 955 960
 Met Met Ser Gln Glu Leu Met Asn Ser Gly Glu His Gln Asn Arg Lys
 965 970 975
 Gly Ala His Ala Thr Arg Ser Ala Cys Ala Lys Ala Lys Asn Phe Gly
 980 985 990
 Phe Glu Val Cys Phe Glu Gly Lys Ser Glu Asn Val Ala Phe Leu Arg
 995 1000 1005
 Asp Ser Pro Leu Tyr Lys Ile Ile Gly Gln His His Cys Lys Ile Ala
 1010 1015 1020
 Leu Lys Pro Ser His Ser Ser Glu Ala Thr Ile Glu Lys Ile Gln Leu
 1025 1030 1035 1040

Glu Leu Gln Thr Gly Asn Lys Ala Ala Ser Lys Ile Ile Arg Val Val
 1045 1050 1055
 Ala Met Gln Ser Leu Ala Glu Ala Asp Glu Met Lys Gly Asn Ile Leu
 1060 1065 1070
 Lys Lys Leu Asn Lys Leu Leu Thr Val Asp Gly Glu Thr Gln Asp Ser
 1075 1080 1085
 Thr Leu Arg Gly Phe Lys Arg Arg Ser Ser Ser Ser Ser Ser Ser
 1090 1095 1100
 Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Gln
 1105 1110 1115 1120
 Gln Ser Arg Met Glu Lys Arg Met Glu Gln Asp Lys Leu Thr Glu Asn
 1125 1130 1135
 Leu Glu Arg Asp Arg Asp His Met Arg Gly Lys Gln Ser Lys Asn Lys
 1140 1145 1150
 Lys Gln Glu Trp Lys Asn Lys Gln Lys Lys His His Lys Gln Leu Pro
 1155 1160 1165
 Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Gly Ser Asn Ser Ser
 1170 1175 1180
 Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Arg Ser His Asn His
 1185 1190 1195 1200
 Arg Asn Asn Thr Arg Thr Leu Ser Lys Ser Lys Arg Tyr Gln Asn Asn
 1205 1210 1215
 Asn Asn Ser Ser Ser Ser Ser Gly Ser Ser Ser Ser Ser Glu Glu Ile
 1220 1225 1230
 Gln Lys Asn Pro Glu Ile Phe Ala Tyr Arg Phe Arg Ser His Arg Asp
 1235 1240 1245
 Lys Leu Gly Phe Gln Asn Lys Arg Gly Arg Met Ser Ser Ser Ser Ser
 1250 1255 1260
 Ser Ser Ser Ser Ser Ser Ser Gln Ser Thr Leu Asn Ser Lys Gln Asp
 1265 1270 1275 1280
 Ala Lys Phe Leu Gly Asp Ser Ser Pro Pro Ile Phe Ala Phe Val Ala
 1285 1290 1295
 Arg Ala Val Arg Ser Asp Gly Leu Gln Gln Gly Tyr Gln Val Ala Ala
 1300 1305 1310
 Tyr Thr Asp Asn Arg Val Ser Arg Pro Arg Val Gln Leu Leu Ala Thr
 1315 1320 1325
 Glu Ile Ile Glu Lys Ser Arg Trp Gln Ile Cys Ala Asp Ala Ile Leu
 1330 1335 1340
 Ala Ser Asn Tyr Lys Ala Met Ala Leu Met Arg Trp Gly Glu Glu Cys
 1345 1350 1355 1360

Gln Asp Tyr Lys Val Ala Val Ser Ala Val Thr Gly Arg Leu Ala Ser
 1365 1370 1375
 His Pro Ser Leu Gln Ile Lys Ala Lys Trp Ser Arg Ile Pro Arg Ala
 1380 1385 1390
 Ala Lys Gln Thr Gln Asn Ile Leu Ala Glu Tyr Val Pro Gly Ala Ala
 1395 1400 1405
 Phe Met Leu Gly Phe Ser Gln Lys Glu Gln Arg Asn Pro Ser Lys Gln
 1410 1415 1420
 Phe Lys Ile Ile Leu Ala Val Thr Ser Pro Asn Thr Ile Asp Thr Leu
 1425 1430 1435 1440
 Ile Lys Ala Pro Lys Ile Thr Leu Phe Lys Gln Ala Val Gln Ile Pro
 1445 1450 1455
 Val Gln Ile Pro Met Glu Pro Ser Asp Ala Glu Arg Arg Ser Pro Gly
 1460 1465 1470
 Leu Ala Ser Ile Met Asn Glu Ile Pro Phe Leu Ile Glu Glu Ala Thr
 1475 1480 1485
 Lys Ser Lys Cys Val Ala Gln Glu Asn Lys Phe Ile Thr Phe Asp Gly
 1490 1495 1500
 Val Lys Phe Ser Tyr Gln Met Pro Gly Gly Cys Tyr His Ile Leu Ala
 1505 1510 1515 1520
 Gln Asp Cys Arg Ser Lys Val Arg Phe Met Val Met Leu Lys Gln Ala
 1525 1530 1535
 Ser Met Ser Lys Asn Leu Arg Ala Val Asn Ala Lys Ile Tyr Asn Lys
 1540 1545 1550
 Asp Ile Asp Ile Leu Pro Thr Thr Lys Gly Ser Val Arg Leu Leu Ile
 1555 1560 1565
 Asn Asn Asn Glu Ile Pro Leu Ser Gln Leu Pro Phe Thr Asp Ser Ser
 1570 1575 1580
 Gly Asn Ile His Ile Lys Arg Ala Asp Glu Gly Val Ser Val Ser Ala
 1585 1590 1595 1600
 Gln Gln Tyr Gly Leu Glu Ser Leu Tyr Phe Asp Gly Lys Thr Val Gln
 1605 1610 1615
 Val Lys Val Thr Ser Glu Met Arg Gly Lys Thr Cys Gly Leu Cys Gly
 1620 1625 1630
 His Asn Asp Gly Glu Arg Arg Lys Glu Phe Arg Met Pro Asp Gly Arg
 1635 1640 1645
 Gln Ala Arg Gly Pro Ser Val Ser Pro Thr Pro Gly Leu Cys Leu Glu
 1650 1655 1660
 Lys Thr Ala Thr Glu Ala Ala Ser Phe Cys Val Ile Met
 1665 1670 1675

<210> 18
 <211> 1807
 <212> PRT
 <213> *Xenopus laevis*

<220>
 <223> African clawed frog vitellogenin

<400> 18
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 1 5 10 15
 Arg Thr His Ile Glu Pro Val Phe Ser Glu Ser Lys Ile Ser Val Tyr
 20 25 30
 Asn Tyr Glu Ala Val Ile Leu Asn Gly Phe Pro Glu Ser Gly Leu Ser
 35 40 45
 Arg Ala Gly Ile Lys Ile Asn Cys Lys Val Glu Ile Ser Ala Tyr Ala
 50 55 60
 Gln Arg Ser Tyr Phe Leu Lys Ile Gln Ser Pro Glu Ile Lys Glu Tyr
 65 70 75 80
 Asn Gly Val Trp Pro Lys Asp Pro Phe Thr Arg Ser Ser Lys Leu Thr
 85 90 95
 Gln Ala Leu Ala Glu Gln Leu Thr Lys Pro Ala Arg Phe Glu Tyr Ser
 100 105 110
 Asn Gly Arg Val Gly Asp Ile Phe Val Ala Asp Asp Val Ser Asp Thr
 115 120 125
 Val Ala Asn Ile Tyr Arg Gly Ile Leu Asn Leu Leu Gln Val Thr Ile
 130 135 140
 Lys Lys Ser Gln Asp Val Tyr Asp Leu Gln Glu Ser Ser Val Gly Gly
 145 150 155 160
 Ile Cys His Thr Arg Tyr Val Ile Gln Glu Asp Lys Arg Gly Asp Gln
 165 170 175
 Ile Arg Ile Ile Lys Ser Thr Asp Phe Asn Asn Cys Gln Asp Lys Val
 180 185 190
 Ser Lys Thr Ile Gly Leu Glu Leu Ala Glu Phe Cys His Ser Cys Lys
 195 200 205
 Gln Leu Asn Arg Val Ile Gln Gly Ala Ala Thr Tyr Thr Tyr Lys Leu
 210 215 220
 Lys Gly Arg Asp Gln Gly Thr Val Ile Met Glu Val Thr Ala Arg Gln
 225 230 235 240
 Val Leu Gln Val Thr Pro Phe Ala Glu Arg His Gly Ala Ala Thr Met
 245 250 255
 Glu Ser Arg Gln Val Leu Ala Trp Val Gly Ser Lys Ser Gly Gln Leu
 260 265 270

Thr	Pro	Pro	Gln	Ile	Gln	Leu	Lys	Asn	Arg	Gly	Asn	Leu	His	Tyr	Gln	
		275					280					285				
Phe	Ala	Ser	Glu	Leu	His	Gln	Met	Pro	Ile	His	Leu	Met	Lys	Thr	Lys	
	290					295					300					
Ser	Pro	Glu	Ala	Gln	Ala	Val	Glu	Val	Leu	Gln	His	Leu	Val	Gln	Asp	
305					310					315					320	
Thr	Gln	Gln	His	Ile	Arg	Glu	Asp	Ala	Pro	Ala	Lys	Phe	Leu	Gln	Leu	
				325					330					335		
Val	Gln	Leu	Leu	Arg	Ala	Ser	Asn	Phe	Glu	Asn	Leu	Gln	Ala	Leu	Trp	
			340					345					350			
Lys	Gln	Phe	Ala	Gln	Arg	Thr	Gln	Tyr	Arg	Arg	Cys	Leu	Leu	Asp	Ala	
		355					360					365				
Leu	Pro	Met	Ala	Gly	Thr	Val	Asp	Cys	Leu	Lys	Phe	Ile	Lys	Gln	Leu	
	370					375					380					
Ile	His	Asn	Glu	Glu	Leu	Thr	Thr	Gln	Glu	Ala	Ala	Val	Leu	Ile	Thr	
385					390					395					400	
Phe	Ala	Met	Arg	Ser	Ala	Arg	Pro	Gly	Gln	Arg	Asn	Phe	Gln	Ile	Ser	
				405					410					415		
Ala	Asp	Leu	Val	Gln	Asp	Ser	Lys	Val	Gln	Lys	Tyr	Ser	Thr	Val	His	
			420					425					430			
Lys	Ala	Ala	Ile	Leu	Ala	Tyr	Gly	Thr	Met	Val	Arg	Arg	Tyr	Cys	Asp	
	435						440					445				
Gln	Leu	Ser	Ser	Cys	Pro	Glu	His	Ala	Leu	Glu	Pro	Leu	His	Glu	Leu	
	450					455					460					
Ala	Ala	Glu	Ala	Ala	Asn	Lys	Gly	His	Tyr	Glu	Asp	Ile	Ala	Leu	Ala	
465					470					475					480	
Leu	Lys	Ala	Leu	Gly	Asn	Ala	Gly	Gln	Pro	Glu	Ser	Ile	Lys	Arg	Ile	
				485					490					495		
Gln	Lys	Phe	Leu	Pro	Gly	Phe	Ser	Ser	Ser	Ala	Asp	Gln	Leu	Pro	Val	
			500					505					510			
Arg	Ile	Gln	Thr	Asp	Ala	Val	Met	Ala	Leu	Arg	Asn	Ile	Ala	Lys	Glu	
		515					520					525				
Asp	Pro	Arg	Lys	Val	Gln	Glu	Ile	Leu	Leu	Gln	Ile	Phe	Met	Asp	Arg	
	530					535					540					
Asp	Val	Arg	Thr	Glu	Val	Arg	Met	Met	Ala	Cys	Leu	Ala	Leu	Phe	Glu	
545					550					555					560	
Thr	Arg	Pro	Gly	Leu	Ala	Thr	Val	Thr	Ala	Ile	Ala	Asn	Val	Ala	Ala	
				565					570					575		
Arg	Glu	Ser	Lys	Thr	Asn	Leu	Gln	Leu	Ala	Ser	Phe	Thr	Phe	Ser	Gln	
			580					585					590			

Met	Lys	Ala	Leu	Ser	Lys	Ser	Ser	Val	Pro	His	Leu	Glu	Pro	Leu	Ala		
		595					600					605					
Ala	Ala	Cys	Ser	Val	Ala	Leu	Lys	Ile	Leu	Asn	Pro	Ser	Leu	Asp	Asn		
	610					615					620						
Leu	Gly	Tyr	Arg	Tyr	Ser	Lys	Val	Met	Arg	Val	Asp	Thr	Phe	Lys	Tyr		
625					630					635					640		
Asn	Leu	Met	Ala	Gly	Ala	Ala	Ala	Lys	Val	Phe	Ile	Met	Asn	Ser	Ala		
				645					650					655			
Asn	Thr	Met	Phe	Pro	Val	Phe	Ile	Leu	Ala	Lys	Phe	Arg	Glu	Tyr	Thr		
			660					665						670			
Ser	Leu	Val	Glu	Asn	Asp	Asp	Ile	Glu	Ile	Gly	Ile	Arg	Gly	Glu	Gly		
		675					680						685				
Ile	Glu	Glu	Phe	Leu	Arg	Lys	Gln	Asn	Ile	Gln	Phe	Ala	Asn	Phe	Pro		
	690					695					700						
Met	Arg	Lys	Lys	Ile	Ser	Gln	Ile	Val	Lys	Ser	Leu	Leu	Gly	Phe	Lys		
705					710					715					720		
Gly	Leu	Pro	Ser	Gln	Val	Pro	Leu	Ile	Ser	Gly	Tyr	Ile	Lys	Leu	Phe		
				725					730						735		
Gly	Gln	Glu	Ile	Ala	Phe	Thr	Glu	Leu	Asn	Lys	Glu	Val	Ile	Gln	Asn		
			740					745						750			
Thr	Ile	Gln	Ala	Leu	Asn	Gln	Pro	Ala	Glu	Arg	His	Thr	Met	Ile	Arg		
		755					760						765				
Asn	Val	Leu	Asn	Lys	Leu	Leu	Asn	Gly	Val	Val	Gly	Gln	Tyr	Ala	Arg		
	770					775					780						
Arg	Trp	Met	Thr	Trp	Glu	Tyr	Arg	His	Ile	Ile	Pro	Thr	Thr	Val	Gly		
785					790					795					800		
Leu	Pro	Ala	Glu	Leu	Ser	Leu	Tyr	Gln	Ser	Ala	Ile	Val	His	Ala	Ala		
				805					810						815		
Val	Asn	Ser	Asp	Val	Lys	Val	Lys	Pro	Thr	Pro	Ser	Gly	Asp	Phe	Ser		
			820					825					830				
Ala	Ala	Gln	Leu	Leu	Glu	Ser	Gln	Ile	Gln	Leu	Asn	Gly	Glu	Val	Lys		
		835					840					845					
Pro	Ser	Val	Leu	Val	His	Thr	Val	Ala	Thr	Met	Gly	Ile	Asn	Ser	Pro		
						855					860						
Leu	Phe	Gln	Ala	Gly	Ile	Glu	Phe	His	Gly	Lys	Val	His	Ala	His	Leu		
865					870					875					880		
Pro	Ala	Lys	Phe	Thr	Ala	Phe	Leu	Asp	Met	Lys	Asp	Arg	Asn	Phe	Lys		
				885					890					895			
Ile	Glu	Thr	Pro	Pro	Phe	Gln	Gln	Glu	Asn	His	Leu	Val	Glu	Ile	Arg		
			900					905						910			

Ala	Gln	Thr	Phe	Ala	Phe	Thr	Arg	Asn	Ile	Ala	Asp	Leu	Asp	Ser	Ala	915	920	925
Arg	Lys	Thr	Leu	Val	Val	Pro	Arg	Asn	Asn	Glu	Gln	Asn	Ile	Leu	Lys	930	935	940
Lys	His	Phe	Glu	Thr	Thr	Gly	Arg	Thr	Ser	Ala	Glu	Gly	Ala	Ser	Met	945	950	955
Met	Glu	Asp	Ser	Ser	Glu	Met	Gly	Pro	Lys	Lys	Tyr	Ser	Ala	Glu	Pro	965	970	975
Gly	His	His	Gln	Tyr	Ala	Pro	Asn	Ile	Asn	Ser	Tyr	Asp	Ala	Cys	Thr	980	985	990
Lys	Phe	Ser	Lys	Ala	Gly	Val	His	Leu	Cys	Ile	Gln	Cys	Lys	Thr	His	995	1000	1005
Asn	Ala	Ala	Ser	Arg	Arg	Asn	Thr	Ile	Phe	Tyr	Gln	Ala	Val	Gly	Glu	1010	1015	1020
His	Asp	Phe	Lys	Leu	Thr	Met	Lys	Pro	Ala	His	Thr	Glu	Gly	Ala	Ile	1025	1030	1035
Glu	Lys	Leu	Gln	Leu	Glu	Ile	Thr	Ala	Gly	Pro	Lys	Ala	Ala	Ser	Lys	1045	1050	1055
Ile	Met	Gly	Leu	Val	Glu	Val	Glu	Gly	Thr	Glu	Gly	Glu	Pro	Met	Asp	1060	1065	1070
Glu	Thr	Ala	Val	Thr	Lys	Arg	Leu	Lys	Met	Ile	Leu	Gly	Ile	Asp	Glu	1075	1080	1085
Ser	Arg	Lys	Asp	Thr	Asn	Glu	Thr	Ala	Leu	Tyr	Arg	Ser	Lys	Gln	Lys	1090	1095	1100
Lys	Lys	Asn	Lys	Ile	His	Asn	Arg	Arg	Leu	Asp	Ala	Glu	Val	Val	Glu	1105	1110	1115
Ala	Arg	Lys	Gln	Gln	Ser	Ser	Leu	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	1125	1130	1135
Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	1140	1145	1150
Ser	Pro	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Tyr	Ser	Lys	Arg	Ser	Lys	Arg	1155	1160	1165
Arg	Glu	His	Asn	Pro	His	His	Gln	Arg	Glu	Ser	Ser	Ser	Ser	Ser	Ser	1170	1175	1180
Gln	Glu	Gln	Asn	Lys	Lys	Arg	Asn	Leu	Gln	Glu	Asn	Arg	Lys	His	Gly	1185	1190	1195
Gln	Lys	Gly	Met	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	1205	1210	1215
Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Ser	1220	1225	1230

Glu Glu Asn Arg Pro His Lys Asn Arg Gln His Asp Asn Lys Gln Ala
 1235 1240 1245
 Lys Met Gln Ser Asn Gln His Gln Gln Lys Lys Asn Lys Phe Ser Glu
 1250 1255 1260
 Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Glu Met Trp Asn Lys
 1265 1270 1275 1280
 Lys Lys His His Arg Asn Phe Tyr Asp Leu Asn Phe Arg Arg Thr Ala
 1285 1290 1295
 Arg Thr Lys Gly Thr Glu His Arg Gly Ser Arg Leu Ser Ser Ser Ser
 1300 1305 1310
 Glu Ser Ser Ser Ser Ser Ser Glu Ser Ala Tyr Arg His Lys Ala Lys
 1315 1320 1325
 Phe Leu Gly Asp Lys Glu Pro Pro Val Leu Val Val Thr Phe Lys Ala
 1330 1335 1340
 Val Arg Asn Asp Asn Thr Lys Gln Gly Tyr Gln Met Val Val Tyr Gln
 1345 1350 1355 1360
 Glu Tyr His Ser Ser Lys Gln Gln Ile Gln Ala Tyr Val Met Asp Ile
 1365 1370 1375
 Ser Lys Thr Arg Trp Ala Ala Cys Phe Asp Ala Val Val Val Asn Pro
 1380 1385 1390
 His Glu Ala Gln Ala Ser Leu Lys Trp Gly Gln Asn Cys Gln Asp Tyr
 1395 1400 1405
 Lys Ile Asn Met Lys Ala Glu Thr Gly Asn Phe Gly Asn Gln Pro Ala
 1410 1415 1420
 Leu Arg Val Thr Ala Asn Trp Pro Lys Ile Pro Ser Lys Trp Lys Ser
 1425 1430 1435 1440
 Thr Gly Lys Val Val Gly Glu Tyr Val Pro Gly Ala Met Tyr Met Met
 1445 1450 1455
 Gly Phe Gln Gly Glu Tyr Lys Arg Asn Ser Gln Arg Gln Val Lys Leu
 1460 1465 1470
 Val Phe Ala Leu Ser Ser Pro Arg Thr Cys Asp Val Val Ile Arg Ile
 1475 1480 1485
 Pro Arg Leu Thr Val Tyr Tyr Arg Ala Leu Arg Leu Pro Val Pro Ile
 1490 1495 1500
 Pro Val Gly His His Ala Lys Glu Asn Val Leu Gln Thr Pro Thr Trp
 1505 1510 1515 1520
 Asn Ile Phe Ala Glu Ala Pro Lys Leu Ile Met Asp Ser Ile Gln Gly
 1525 1530 1535
 Glu Cys Lys Val Ala Gln Asp Gln Ile Thr Thr Phe Asn Gly Val Asp
 1540 1545 1550

Leu Ala Ser Ala Leu Pro Glu Asn Cys Tyr Asn Val Leu Ala Gln Asp
 1555 1560 1565
 Cys Ser Pro Glu Met Lys Phe Met Val Leu Met Arg Asn Ser Lys Glu
 1570 1575 1580
 Ser Pro Asn His Lys Asp Ile Asn Val Lys Leu Gly Glu Tyr Asp Ile
 1585 1590 1595 1600
 Asp Met Tyr Tyr Ser Ala Asp Ala Phe Lys Met Lys Ile Asn Asn Leu
 1605 1610 1615
 Glu Val Ser Glu Glu His Leu Pro Tyr Lys Ser Phe Asn Tyr Pro Thr
 1620 1625 1630
 Val Glu Ile Lys Lys Lys Gly Asn Gly Val Ser Leu Ser Ala Ser Glu
 1635 1640 1645
 Tyr Gly Ile Asp Ser Leu Asp Tyr Asp Gly Leu Thr Phe Lys Phe Arg
 1650 1655 1660
 Pro Thr Ile Trp Met Lys Gly Lys Thr Cys Gly Ile Cys Gly His Asn
 1665 1670 1675 1680
 Asp Asp Glu Ser Glu Lys Glu Leu Gln Met Pro Asp Gly Ser Val Ala
 1685 1690 1695
 Lys Asp Gln Met Arg Phe Ile His Ser Trp Ile Leu Pro Ala Glu Ser
 1700 1705 1710
 Cys Ser Glu Gly Cys Asn Leu Lys His Thr Leu Val Lys Leu Glu Lys
 1715 1720 1725
 Ala Ile Ala Thr Asp Gly Ala Lys Ala Lys Cys Tyr Ser Val Gln Pro
 1730 1735 1740
 Val Leu Arg Cys Ala Lys Gly Cys Ser Pro Val Lys Thr Val Glu Val
 1745 1750 1755 1760
 Ser Thr Gly Phe His Cys Leu Pro Ser Asp Val Ser Leu Asp Leu Pro
 1765 1770 1775
 Glu Gly Gln Ile Arg Leu Glu Lys Ser Glu Asp Phe Ser Glu Lys Val
 1780 1785 1790
 Glu Ala His Thr Ala Cys Ser Cys Glu Thr Ser Pro Cys Ala Ala
 1795 1800 1805

<210> 19
 <211> 1852
 <212> PRT
 <213> Gallus gallus

<220>
 <223> chicken vitellogenin

<400> 19
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Lys Phe Asp Ile Asp Pro Gly Phe Asn Ser Arg Arg Ser Tyr Leu Tyr
 20 25 30
 Asn Tyr Glu Gly Ser Met Leu Asn Gly Leu Gln Asp Arg Ser Leu Gly
 35 40 45
 Lys Ala Gly Val Arg Leu Ser Ser Lys Leu Glu Ile Ser Gly Leu Pro
 50 55 60
 Glu Asn Ala Tyr Leu Leu Lys Val Arg Ser Pro Gln Val Glu Glu Tyr
 65 70 75 80
 Asn Gly Val Trp Pro Arg Asp Pro Phe Thr Arg Ser Ser Lys Ile Thr
 85 90 95
 Gln Val Ile Ser Ser Cys Phe Thr Arg Leu Phe Lys Phe Glu Tyr Ser
 100 105 110
 Ser Gly Arg Ile Gly Asn Ile Tyr Ala Pro Glu Asp Cys Pro Asp Leu
 115 120 125
 Cys Val Asn Ile Val Arg Gly Ile Leu Asn Met Phe Gln Met Thr Ile
 130 135 140
 Lys Lys Ser Gln Asn Val Tyr Glu Leu Gln Glu Ala Gly Ile Gly Gly
 145 150 155 160
 Ile Cys His Ala Arg Tyr Val Ile Gln Glu Asp Arg Lys Asn Ser Arg
 165 170 175
 Ile Tyr Val Thr Arg Thr Val Asp Leu Asn Asn Cys Gln Glu Lys Val
 180 185 190
 Gln Lys Ser Ile Gly Met Ala Tyr Ile Tyr Pro Cys Pro Val Asp Val
 195 200 205
 Met Lys Glu Arg Leu Thr Lys Gly Thr Thr Ala Phe Ser Tyr Lys Leu
 210 215 220
 Lys Gln Ser Asp Ser Gly Thr Leu Ile Thr Asp Val Ser Ser Arg Gln
 225 230 235 240
 Val Tyr Gln Ile Ser Pro Phe Asn Glu Pro Thr Gly Val Ala Val Met
 245 250 255
 Glu Ala Arg Gln Gln Leu Thr Leu Val Glu Val Arg Ser Glu Arg Gly
 260 265 270
 Ser Ala Pro Asp Val Pro Met Gln Asn Tyr Gly Ser Leu Arg Tyr Arg
 275 280 285
 Phe Pro Ala Val Leu Pro Gln Met Pro Leu Gln Leu Ile Lys Thr Lys
 290 295 300
 Asn Pro Glu Gln Arg Ile Val Glu Thr Leu Gln His Ile Val Leu Asn
 305 310 315 320
 Asn Gln Gln Asp Phe His Asp Asp Val Ser Tyr Arg Phe Leu Glu Val
 325 330 335

Val Gln Leu Cys Arg Ile Ala Asn Ala Asp Asn Leu Glu Ser Ile Trp
340 345 350
Arg Gln Val Ser Asp Lys Pro Arg Tyr Arg Arg Trp Leu Leu Ser Ala
355 360 365
Val Ser Ala Ser Gly Thr Thr Glu Thr Leu Lys Phe Leu Lys Asn Arg
370 375 380
Ile Arg Asn Asp Asp Leu Asn Tyr Ile Gln Thr Leu Leu Thr Val Ser
385 390 395 400
Leu Thr Leu His Leu Leu Gln Ala Asp Glu His Thr Leu Pro Ile Ala
405 410 415
Ala Asp Leu Met Thr Ser Ser Arg Ile Gln Lys Asn Pro Val Leu Gln
420 425 430
Gln Val Ala Cys Leu Gly Tyr Ser Ser Val Val Asn Arg Tyr Cys Ser
435 440 445
Gln Thr Ser Ala Cys Pro Lys Glu Ala Leu Gln Pro Ile His Asp Leu
450 455 460
Ala Asp Glu Ala Ile Ser Arg Gly Arg Glu Asp Lys Met Lys Leu Ala
465 470 475 480
Leu Lys Cys Ile Gly Asn Met Gly Glu Pro Ala Ser Leu Lys Arg Ile
485 490 495
Leu Lys Phe Leu Pro Ile Ser Ser Ser Ser Ala Ala Asp Ile Pro Val
500 505 510
His Ile Gln Ile Asp Ala Ile Thr Ala Leu Lys Lys Ile Ala Trp Lys
515 520 525
Asp Pro Lys Thr Val Gln Gly Tyr Leu Ile Gln Ile Leu Ala Asp Gln
530 535 540
Ser Leu Pro Pro Glu Val Arg Met Met Ala Cys Ala Val Ile Phe Glu
545 550 555 560
Thr Arg Pro Ala Leu Ala Leu Ile Thr Thr Ile Ala Asn Val Ala Met
565 570 575
Lys Glu Ser Lys Thr Asn Met Gln Val Ala Ser Phe Val Tyr Ser His
580 585 590
Met Lys Ser Leu Ser Lys Ser Arg Leu Pro Phe Met Tyr Asn Ile Ser
595 600 605
Ser Ala Cys Asn Ile Ala Leu Lys Leu Leu Ser Pro Lys Leu Asp Ser
610 615 620
Met Ser Tyr Arg Tyr Ser Lys Val Ile Arg Ala Asp Thr Tyr Phe Asp
625 630 635 640
Asn Tyr Arg Val Gly Ala Thr Gly Glu Ile Phe Val Val Asn Ser Pro
645 650 655

Arg	Thr	Met	Phe	Pro	Ser	Ala	Ile	Ile	Ser	Lys	Leu	Met	Ala	Asn	Ser		
			660					665					670				
Ala	Gly	Ser	Val	Ala	Asp	Leu	Val	Glu	Val	Gly	Ile	Arg	Val	Glu	Gly		
		675					680					685					
Leu	Ala	Asp	Val	Ile	Met	Lys	Arg	Asn	Ile	Pro	Phe	Ala	Glu	Tyr	Pro		
	690					695					700						
Thr	Tyr	Lys	Gln	Ile	Lys	Glu	Leu	Gly	Lys	Ala	Leu	Gln	Gly	Trp	Lys		
705					710					715					720		
Glu	Leu	Pro	Thr	Glu	Thr	Pro	Leu	Val	Ser	Ala	Tyr	Leu	Lys	Ile	Leu		
			725						730					735			
Gly	Gln	Glu	Val	Ala	Phe	Ile	Asn	Ile	Asn	Lys	Glu	Leu	Leu	Gln	Gln		
			740					745					750				
Val	Met	Lys	Thr	Val	Val	Glu	Pro	Ala	Asp	Arg	Asn	Ala	Ala	Ile	Lys		
		755					760					765					
Arg	Ile	Ala	Asn	Gln	Ile	Leu	Asn	Ser	Ile	Ala	Gly	Gln	Trp	Thr	Gln		
	770					775					780						
Pro	Val	Trp	Met	Gly	Glu	Leu	Arg	Tyr	Val	Val	Pro	Ser	Cys	Leu	Gly		
785					790					795					800		
Leu	Pro	Leu	Glu	Tyr	Gly	Ser	Tyr	Thr	Thr	Ala	Leu	Ala	Arg	Ala	Ala		
			805						810					815			
Val	Ser	Val	Glu	Gly	Lys	Met	Thr	Pro	Pro	Leu	Thr	Gly	Asp	Phe	Arg		
		820						825					830				
Leu	Ser	Gln	Leu	Leu	Glu	Ser	Thr	Met	Gln	Ile	Arg	Ser	Asp	Leu	Lys		
		835					840					845					
Pro	Ser	Leu	Tyr	Val	His	Thr	Val	Ala	Thr	Met	Gly	Val	Asn	Thr	Glu		
	850					855					860						
Tyr	Phe	Gln	His	Ala	Val	Glu	Ile	Gln	Gly	Glu	Val	Gln	Thr	Arg	Met		
865					870					875					880		
Pro	Met	Lys	Phe	Asp	Ala	Lys	Ile	Asp	Val	Lys	Leu	Lys	Asn	Leu	Lys		
			885						890					895			
Ile	Glu	Thr	Asn	Pro	Cys	Arg	Glu	Glu	Thr	Glu	Ile	Val	Val	Gly	Arg		
			900					905					910				
His	Lys	Ala	Phe	Ala	Val	Ser	Arg	Asn	Ile	Gly	Glu	Leu	Gly	Val	Glu		
	915						920					925					
Lys	Arg	Thr	Ser	Ile	Leu	Pro	Glu	Asp	Ala	Pro	Leu	Asp	Val	Thr	Glu		
	930					935					940						
Glu	Pro	Phe	Gln	Thr	Ser	Glu	Arg	Ala	Ser	Arg	Glu	His	Phe	Ala	Met		
945					950					955					960		
Gln	Gly	Pro	Asp	Ser	Met	Pro	Arg	Lys	Gln	Ser	His	Ser	Ser	Arg	Glu		
				965					970					975			

Asp Leu Arg Arg Ser Thr Gly Lys Arg Ala His Lys Arg Asp Ile Cys
 980 985 990
 Leu Lys Met His His Ile Gly Cys Gln Leu Cys Phe Ser Arg Arg Ser
 995 1000 1005
 Arg Asp Ala Ser Phe Ile Gln Asn Thr Tyr Leu His Lys Leu Ile Gly
 1010 1015 1020
 Glu His Glu Ala Lys Ile Val Leu Met Pro Val His Thr Asp Ala Asp
 1025 1030 1035 1040
 Ile Asp Lys Ile Gln Leu Glu Ile Gln Ala Gly Ser Arg Ala Ala Ala
 1045 1050 1055
 Arg Ile Ile Thr Glu Val Asn Pro Glu Ser Glu Glu Glu Asp Glu Ser
 1060 1065 1070
 Ser Pro Tyr Glu Asp Ile Gln Ala Lys Leu Lys Arg Ile Leu Gly Ile
 1075 1080 1085
 Asp Ser Met Phe Lys Val Ala Asn Lys Thr Arg His Pro Lys Asn Arg
 1090 1095 1100
 Pro Ser Lys Lys Gly Asn Thr Val Leu Ala Glu Phe Gly Thr Glu Pro
 1105 1110 1115 1120
 Asp Ala Lys Thr Ser Ser Ser Ser Ser Ala Ser Ser Thr Ala Thr
 1125 1130 1135
 Ser Ser Ala Ser Ser Ser Ala Ser Ser Pro Asn Arg Lys Lys Pro Met
 1140 1145 1150
 Asp Glu Glu Glu Asn Asp Gln Val Lys Gln Ala Arg Asn Lys Asp Ala
 1155 1160 1165
 Ser Ser Ser Ser Arg Ser Ser Lys Ser Ser Asn Ser Ser Lys Arg Ser
 1170 1175 1180
 Ser Ser Lys Ser Ser Asn Ser Ser Lys Arg Ser Ser Ser Ser Ser Ser
 1185 1190 1195 1200
 Ser Ser Ser Ser Ser Ser Arg Ser Ser Ser Ser Ser Ser Ser Ser Ser
 1205 1210 1215
 Ser Asn Ser Lys Ser Ser Ser Ser Ser Ser Lys Ser Ser Ser Ser Ser
 1220 1225 1230
 Ser Arg Ser Arg Ser Ser Ser Lys Ser Ser Ser Ser Ser Ser Ser Ser
 1235 1240 1245
 Ser Ser Ser Ser Ser Ser Lys Ser Ser Ser Ser Arg Ser Ser Ser Ser
 1250 1255 1260
 Ser Ser Lys Ser Ser Ser His His Ser His Ser His His Ser Gly His
 1265 1270 1275 1280
 Leu Asn Gly Ser Ser Ser Ser Ser Ser Ser Arg Ser Val Ser His
 1285 1290 1295

His Ser His Glu His His Ser Gly His Leu Glu Asp Asp Ser Ser Ser
 1300 1305 1310
 Ser Ser Ser Ser Ser Val Leu Ser Lys Ile Trp Gly Arg His Glu Ile
 1315 1320 1325
 Tyr Gln Tyr Arg Phe Arg Ser Ala His Arg Gln Glu Phe Pro Lys Arg
 1330 1335 1340
 Lys Leu Pro Gly Asp Arg Ala Thr Ser Arg Tyr Ser Ser Thr Arg Ser
 1345 1350 1355 1360
 Ser His Asp Thr Ser Arg Ala Ala Ser Trp Pro Lys Phe Leu Gly Asp
 1365 1370 1375
 Ile Lys Thr Pro Val Leu Ala Ala Phe Leu His Gly Ile Ser Asn Asn
 1380 1385 1390
 Lys Lys Thr Gly Gly Leu Gln Leu Val Val Tyr Ala Asp Thr Asp Ser
 1395 1400 1405
 Val Arg Pro Arg Val Gln Val Phe Val Thr Asn Leu Thr Asp Ser Ser
 1410 1415 1420
 Lys Trp Lys Leu Cys Ala Asp Ala Ser Val Arg Asn Ala Pro Gln Ala
 1425 1430 1435 1440
 Val Ala Tyr Val Lys Trp Gly Trp Asp Cys Arg Asp Tyr Lys Val Ser
 1445 1450 1455
 Thr Glu Leu Val Thr Gly Arg Phe Ala Gly His Pro Ala Ala Gln Val
 1460 1465 1470
 Lys Leu Glu Trp Pro Lys Val Pro Ser Asn Val Arg Ser Val Val Glu
 1475 1480 1485
 Trp Phe Tyr Glu Phe Val Pro Gly Ala Ala Phe Met Leu Gly Phe Ser
 1490 1495 1500
 Glu Arg Met Asp Lys Asn Pro Ser Arg Gln Ala Arg Met Val Val Ala
 1505 1510 1515 1520
 Leu Thr Ser Pro Arg Thr Cys Asp Val Val Val Lys Leu Pro Asp Ile
 1525 1530 1535
 Ile Leu Tyr Gln Lys Ala Val Arg Leu Pro Leu Ser Leu Pro Val Gly
 1540 1545 1550
 Pro Arg Ile Pro Ala Ser Glu Leu Gln Pro Pro Ile Trp Asn Val Phe
 1555 1560 1565
 Ala Glu Ala Pro Ser Ala Val Leu Glu Asn Leu Lys Ala Arg Cys Ser
 1570 1575 1580
 Val Ser Tyr Asn Lys Ile Lys Thr Phe Asn Glu Val Lys Phe Asn Tyr
 1585 1590 1595 1600
 Ser Met Pro Ala Asn Cys Tyr His Ile Leu Val Gln Asp Cys Ser Ser
 1605 1610 1615

Glu Leu Lys Phe Leu Val Met Met Lys Ser Ala Gly Glu Ala Thr Asn
 1620 1625 1630
 Leu Lys Ala Ile Asn Ile Lys Ile Gly Ser His Glu Ile Asp Met His
 1635 1640 1645
 Pro Val Asn Gly Gln Val Lys Leu Leu Val Asp Gly Ala Glu Ser Pro
 1650 1655 1660
 Thr Ala Asn Ile Ser Leu Ile Ser Ala Gly Ala Ser Leu Trp Ile His
 1665 1670 1675 1680
 Asn Glu Asn Gln Gly Phe Ala Leu Ala Ala Pro Gly His Gly Ile Asp
 1685 1690 1695
 Lys Leu Tyr Phe Asp Gly Lys Thr Ile Thr Ile Gln Val Pro Leu Trp
 1700 1705 1710
 Met Ala Gly Lys Thr Cys Gly Ile Cys Gly Lys Tyr Asp Ala Glu Cys
 1715 1720 1725
 Glu Gln Glu Tyr Arg Met Pro Asn Gly Tyr Leu Ala Lys Asn Ala Val
 1730 1735 1740
 Ser Phe Gly His Ser Trp Ile Leu Glu Glu Ala Pro Cys Arg Gly Ala
 1745 1750 1755 1760
 Cys Lys Leu His Arg Ser Phe Val Lys Leu Glu Lys Thr Val Gln Leu
 1765 1770 1775
 Ala Gly Val Asp Ser Lys Cys Tyr Ser Thr Glu Pro Val Leu Arg Cys
 1780 1785 1790
 Ala Lys Gly Cys Ser Ala Thr Lys Thr Thr Pro Val Thr Val Gly Phe
 1795 1800 1805
 His Cys Leu Pro Ala Asp Ser Ala Asn Ser Leu Thr Asp Lys Gln Met
 1810 1815 1820
 Lys Tyr Asp Gln Lys Ser Glu Asp Met Gln Asp Thr Val Asp Ala His
 1825 1830 1835 1840
 Thr Thr Cys Ser Cys Glu Asn Glu Glu Cys Ser Thr
 1845 1850

<210> 20
 <211> 1823
 <212> PRT
 <213> Ichthyomyzon unicuspis

 <220>
 <223> lamprey vitellogenin precursor

 <220>
 <221> SIGNAL
 <222> (1)..(14)
 <223> signal peptide

<220>
 <221> PEPTIDE
 <222> (15)..(1823)
 <223> mature chain

<220>
 <221> PEPTIDE
 <222> (15)..(707)
 <223> lipovitellin LV-1N

<220>
 <221> PEPTIDE
 <222> (708)..(1074)
 <223> lipovitellin LV-1C

<220>
 <221> PEPTIDE
 <222> (1306)..(1624)
 <223> lipovitellin LV-2

<400> 20
 Met Trp Lys Leu Leu Leu Val Ala Leu Ala Phe Ala Leu Ala Asp Ala
 1 5 10 15
 Gln Phe Gln Pro Gly Lys Val Tyr Arg Tyr Ser Tyr Asp Ala Phe Ser
 20 25 30
 Ile Ser Gly Leu Pro Glu Pro Gly Val Asn Arg Ala Gly Leu Ser Gly
 35 40 45
 Glu Met Lys Ile Glu Ile His Gly His Thr His Asn Gln Ala Thr Leu
 50 55 60
 Lys Ile Thr Gln Val Asn Leu Lys Tyr Phe Leu Gly Pro Trp Pro Ser
 65 70 75 80
 Asp Ser Phe Tyr Pro Leu Thr Ala Gly Tyr Asp His Phe Ile Gln Gln
 85 90 95
 Leu Glu Val Pro Val Arg Phe Asp Tyr Ser Ala Gly Arg Ile Gly Asp
 100 105 110
 Ile Tyr Ala Pro Pro Gln Val Thr Asp Thr Ala Val Asn Ile Val Arg
 115 120 125
 Gly Ile Leu Asn Leu Phe Gln Leu Ser Leu Lys Lys Asn Gln Gln Thr
 130 135 140
 Phe Glu Leu Gln Glu Thr Gly Val Glu Gly Ile Cys Gln Thr Thr Tyr
 145 150 155 160
 Val Val Gln Glu Gly Tyr Arg Thr Asn Glu Met Ala Val Val Lys Thr
 165 170 175
 Lys Asp Leu Asn Asn Cys Asp His Lys Val Tyr Lys Thr Met Gly Thr
 180 185 190
 Ala Tyr Ala Glu Arg Cys Pro Thr Cys Gln Lys Met Asn Lys Asn Leu
 195 200 205

Arg Ser Thr Ala Val Tyr Asn Tyr Ala Ile Phe Asp Glu Pro Ser Gly
 210 215 220
 Tyr Ile Ile Lys Ser Ala His Ser Glu Glu Ile Gln Gln Leu Ser Val
 225 230 235 240
 Phe Asp Ile Lys Glu Gly Asn Val Val Ile Glu Ser Arg Gln Lys Leu
 245 250 255
 Ile Leu Glu Gly Ile Gln Ser Ala Pro Ala Ala Ser Gln Ala Ala Ser
 260 265 270
 Leu Gln Asn Arg Gly Gly Leu Met Tyr Lys Phe Pro Ser Ser Ala Ile
 275 280 285
 Thr Lys Met Ser Ser Leu Phe Val Thr Lys Gly Lys Asn Leu Glu Ser
 290 295 300
 Glu Ile His Thr Val Leu Lys His Leu Val Glu Asn Asn Gln Leu Ser
 305 310 315 320
 Val His Glu Asp Ala Pro Ala Lys Phe Leu Arg Leu Thr Ala Phe Leu
 325 330 335
 Arg Asn Val Asp Ala Gly Val Leu Gln Ser Ile Trp His Lys Leu His
 340 345 350
 Gln Gln Lys Asp Tyr Arg Arg Trp Ile Leu Asp Ala Val Pro Ala Met
 355 360 365
 Ala Thr Ser Glu Ala Leu Leu Phe Leu Lys Arg Thr Leu Ala Ser Glu
 370 375 380
 Gln Leu Thr Ser Ala Glu Ala Thr Gln Ile Val Tyr Ser Thr Leu Ser
 385 390 395 400
 Asn Gln Gln Ala Thr Arg Glu Ser Leu Ser Tyr Ala Arg Glu Leu Leu
 405 410 415
 His Thr Ser Phe Ile Arg Asn Arg Pro Ile Leu Arg Lys Thr Ala Val
 420 425 430
 Leu Gly Tyr Gly Ser Leu Val Phe Arg Tyr Cys Ala Asn Thr Val Ser
 435 440 445
 Cys Pro Asp Glu Leu Leu Gln Pro Leu His Asp Leu Leu Ser Gln Ser
 450 455 460
 Ser Asp Arg Ala Asp Glu Glu Glu Ile Val Leu Ala Leu Lys Ala Leu
 465 470 475 480
 Gly Asn Ala Gly Gln Pro Asn Ser Ile Lys Lys Ile Gln Arg Phe Leu
 485 490 495
 Pro Gly Gln Gly Lys Ser Leu Asp Glu Tyr Ser Thr Arg Val Gln Ala
 500 505 510
 Glu Ala Ile Met Ala Leu Arg Asn Ile Ala Lys Arg Asp Pro Arg Lys
 515 520 525

Val	Gln	Glu	Ile	Val	Leu	Pro	Ile	Phe	Leu	Asn	Val	Ala	Ile	Lys	Ser	530	535	540
Glu	Leu	Arg	Ile	Arg	Ser	Cys	Ile	Val	Phe	Phe	Glu	Ser	Lys	Pro	Ser	545	550	555
Val	Ala	Leu	Val	Ser	Met	Val	Ala	Val	Arg	Leu	Arg	Arg	Glu	Pro	Asn	565	570	575
Leu	Gln	Val	Ala	Ser	Phe	Val	Tyr	Ser	Gln	Met	Arg	Ser	Leu	Ser	Arg	580	585	590
Ser	Ser	Asn	Pro	Glu	Phe	Arg	Asp	Val	Ala	Ala	Ala	Cys	Ser	Val	Ala	595	600	605
Ile	Lys	Met	Leu	Gly	Ser	Lys	Leu	Asp	Arg	Leu	Gly	Cys	Arg	Tyr	Ser	610	615	620
Lys	Ala	Val	His	Val	Asp	Thr	Phe	Asn	Ala	Arg	Thr	Met	Ala	Gly	Val	625	630	635
Ser	Ala	Asp	Tyr	Phe	Arg	Ile	Asn	Ser	Pro	Ser	Gly	Pro	Leu	Pro	Arg	645	650	655
Ala	Val	Ala	Ala	Lys	Ile	Arg	Gly	Gln	Gly	Met	Gly	Tyr	Ala	Ser	Asp	660	665	670
Ile	Val	Glu	Phe	Gly	Leu	Arg	Ala	Glu	Gly	Leu	Gln	Glu	Leu	Leu	Tyr	675	680	685
Arg	Gly	Ser	Gln	Glu	Gln	Asp	Ala	Tyr	Gly	Thr	Ala	Leu	Asp	Arg	Gln	690	695	700
Thr	Leu	Leu	Arg	Ser	Gly	Gln	Ala	Arg	Ser	His	Val	Ser	Ser	Ile	His	705	710	715
Asp	Thr	Leu	Arg	Lys	Leu	Ser	Asp	Trp	Lys	Ser	Val	Pro	Glu	Glu	Arg	725	730	735
Pro	Leu	Ala	Ser	Gly	Tyr	Val	Lys	Val	His	Gly	Gln	Glu	Val	Val	Phe	740	745	750
Ala	Glu	Leu	Asp	Lys	Lys	Met	Met	Gln	Arg	Ile	Ser	Gln	Leu	Trp	His	755	760	765
Ser	Ala	Arg	Ser	His	His	Ala	Ala	Ala	Gln	Glu	Gln	Ile	Arg	Ala	Val	770	775	780
Val	Ser	Lys	Leu	Glu	Gln	Gly	Met	Asp	Val	Leu	Leu	Thr	Lys	Gly	Tyr	785	790	795
Val	Val	Ser	Glu	Val	Arg	Tyr	Met	Gln	Pro	Val	Cys	Ile	Gly	Ile	Pro	805	810	815
Met	Asp	Leu	Asn	Leu	Leu	Val	Ser	Gly	Val	Thr	Thr	Asn	Arg	Ala	Asn	820	825	830
Leu	His	Ala	Ser	Phe	Ser	Gln	Ser	Leu	Pro	Ala	Asp	Met	Lys	Leu	Ala	835	840	845

Asp Leu Leu Ala Thr Asn Ile Glu Leu Arg Val Ala Ala Thr Thr Ser
 850 855 860
 Met Ser Gln His Ala Val Ala Ile Met Gly Leu Thr Thr Asp Leu Ala
 865 870 875 880
 Lys Ala Gly Met Gln Thr His Tyr Lys Thr Ser Ala Gly Leu Gly Val
 885 890 895
 Asn Gly Lys Ile Glu Met Asn Ala Arg Glu Ser Asn Phe Lys Ala Ser
 900 905 910
 Leu Lys Pro Phe Gln Gln Lys Thr Val Val Val Leu Ser Thr Met Glu
 915 920 925
 Ser Ile Val Phe Val Arg Asp Pro Ser Gly Ser Arg Ile Leu Pro Val
 930 935 940
 Leu Pro Pro Lys Met Thr Leu Asp Lys Gly Leu Ile Ser Gln Gln Gln
 945 950 955 960
 Gln Gln Pro His His Gln Gln Gln Pro His Gln His Gly Gln Asp Gln
 965 970 975
 Ala Arg Ala Ala Tyr Gln Arg Pro Trp Ala Ser His Glu Phe Ser Pro
 980 985 990
 Ala Glu Gln Lys Gln Ile His Asp Ile Met Thr Ala Arg Pro Val Met
 995 1000 1005
 Arg Arg Lys Gln His Cys Ser Lys Ser Ala Ala Leu Ser Ser Lys Val
 1010 1015 1020
 Cys Phe Ser Ala Arg Leu Arg Asn Ala Ala Phe Ile Arg Asn Ala Leu
 1025 1030 1035 1040
 Leu Tyr Lys Ile Thr Gly Asp Tyr Val Ser Lys Val Tyr Val Gln Pro
 1045 1050 1055
 Thr Ser Ser Lys Ala Gln Ile Gln Lys Val Glu Leu Glu Leu Gln Ala
 1060 1065 1070
 Gly Pro Gln Ala Ala Glu Lys Val Ile Arg Met Val Glu Leu Val Ala
 1075 1080 1085
 Lys Ala Ser Lys Lys Ser Lys Lys Asn Ser Thr Ile Thr Glu Glu Gly
 1090 1095 1100
 Val Gly Glu Thr Ile Ile Ser Gln Leu Lys Lys Ile Leu Ser Ser Asp
 1105 1110 1115 1120
 Lys Asp Lys Asp Ala Lys Lys Pro Pro Gly Ser Ser Ser Ser Ser Ser
 1125 1130 1135
 Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Asp Lys Ser Gly
 1140 1145 1150
 Lys Lys Thr Pro Arg Gln Gly Ser Thr Val Asn Leu Ala Ala Lys Arg
 1155 1160 1165

Ala Ser Lys Lys Gln Arg Gly Lys Asp Ser Ser Ser Ser Ser Ser Ser
 1170 1175 1180
 Ser Ser Ser Ser Ser Asp Ser Ser Lys Ser Pro His Lys His Gly Gly
 1185 1190 1195 1200
 Ala Lys Arg Gln His Ala Gly His Gly Ala Pro His Leu Gly Pro Gln
 1205 1210 1215
 Ser His Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser
 1220 1225 1230
 Ala Ser Lys Ser Phe Ser Thr Val Lys Pro Pro Met Thr Arg Lys Pro
 1235 1240 1245
 Arg Pro Ala Arg Ser Ser Ser Ser Ser Ser Ser Ser Asp Ser Ser Ser
 1250 1255 1260
 Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser
 1265 1270 1275 1280
 Ser Ser Ser Ser Glu Ser Lys Ser Leu Glu Trp Leu Ala Val Lys Asp
 1285 1290 1295
 Val Asn Gln Ser Ala Phe Tyr Asn Phe Lys Tyr Val Pro Gln Arg Lys
 1300 1305 1310
 Pro Gln Thr Ser Arg Arg His Thr Pro Ala Ser Ser Ser Ser Ser Ser
 1315 1320 1325
 Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Asp Ser Asp
 1330 1335 1340
 Met Thr Val Ser Ala Glu Ser Phe Glu Lys His Ser Lys Pro Lys Val
 1345 1350 1355 1360
 Val Ile Val Leu Arg Ala Val Arg Ala Asp Gly Lys Gln Gln Gly Leu
 1365 1370 1375
 Gln Thr Thr Leu Tyr Tyr Gly Leu Thr Ser Asn Gly Leu Pro Lys Ala
 1380 1385 1390
 Lys Ile Val Ala Val Glu Leu Ser Asp Leu Ser Val Trp Lys Leu Cys
 1395 1400 1405
 Ala Lys Phe Arg Leu Ser Ala His Met Lys Ala Lys Ala Ala Ile Gly
 1410 1415 1420
 Trp Gly Lys Asn Cys Gln Gln Tyr Arg Ala Met Leu Glu Ala Ser Thr
 1425 1430 1435 1440
 Gly Asn Leu Gln Ser His Pro Ala Ala Arg Val Asp Ile Lys Trp Gly
 1445 1450 1455
 Arg Leu Pro Ser Ser Leu Gln Arg Ala Lys Asn Ala Leu Leu Glu Asn
 1460 1465 1470
 Lys Ala Pro Val Ile Ala Ser Lys Leu Glu Met Glu Ile Met Pro Lys
 1475 1480 1485

Lys Asn Gln Lys His Gln Val Ser Val Ile Leu Ala Ala Met Thr Pro
 1490 1495 1500
 Arg Arg Met Asn Ile Ile Val Lys Leu Pro Lys Val Thr Tyr Phe Gln
 1505 1510 1515 1520
 Gln Gly Ile Leu Leu Pro Phe Thr Phe Pro Ser Pro Arg Phe Trp Asp
 1525 1530 1535
 Arg Pro Glu Gly Ser Gln Ser Asp Ser Leu Pro Ala Gln Ile Ala Ser
 1540 1545 1550
 Ala Phe Ser Gly Ile Val Gln Asp Pro Val Ala Ser Ala Cys Glu Leu
 1555 1560 1565
 Asn Glu Gln Ser Leu Thr Thr Phe Asn Gly Ala Phe Phe Asn Tyr Asp
 1570 1575 1580
 Met Pro Glu Ser Cys Tyr His Val Leu Ala Gln Glu Cys Ser Ser Arg
 1585 1590 1595 1600
 Pro Pro Phe Ile Val Leu Ile Lys Leu Asp Ser Glu Arg Arg Ile Ser
 1605 1610 1615
 Leu Glu Leu Gln Leu Asp Asp Lys Lys Val Lys Ile Val Ser Arg Asn
 1620 1625 1630
 Asp Ile Arg Val Asp Gly Glu Lys Val Pro Leu Arg Arg Leu Ser Gln
 1635 1640 1645
 Lys Asn Gln Tyr Gly Phe Leu Val Leu Asp Ala Gly Val His Leu Leu
 1650 1655 1660
 Leu Lys Tyr Lys Asp Leu Arg Val Ser Phe Asn Ser Ser Ser Val Gln
 1665 1670 1675 1680
 Val Trp Val Pro Ser Ser Leu Lys Gly Gln Thr Cys Gly Leu Cys Gly
 1685 1690 1695
 Arg Asn Asp Asp Glu Leu Val Thr Glu Met Arg Met Pro Asn Leu Glu
 1700 1705 1710
 Val Ala Lys Asp Phe Thr Ser Phe Ala His Ser Trp Ile Ala Pro Asp
 1715 1720 1725
 Glu Thr Cys Gly Gly Ala Cys Ala Leu Ser Arg Gln Thr Val His Lys
 1730 1735 1740
 Glu Ser Thr Ser Val Ile Ser Gly Ser Arg Glu Asn Cys Tyr Ser Thr
 1745 1750 1755 1760
 Glu Pro Ile Met Arg Cys Pro Ala Thr Cys Ser Ala Ser Arg Ser Val
 1765 1770 1775
 Pro Val Ser Val Ala Met His Cys Leu Pro Ala Glu Ser Glu Ala Ile
 1780 1785 1790

Ser Leu Ala Met Ser Glu Gly Arg Pro Phe Ser Leu Ser Gly Lys Ser
 1795 1800 1805

Glu Asp Leu Val Thr Glu Met Glu Ala His Val Ser Cys Val Ala
 1810 1815 1820

<210> 21
 <211> 30
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:PCR mutagenesis
 primer to introduce ApaI restriction site

<400> 21
 ccatgggccc agcacactga ggagtgcagc 30

<210> 22
 <211> 43
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:mutation primer
 to create SpeI restriction site and new internal
 start codon

<400> 22
 tcttgctgtg gctctactag tgatggacca gtccaacttg gcc 43

<210> 23
 <211> 43
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:mutation primer
 to create SpeI restriction site and new internal
 start codon

<400> 23
 ccaagttgga ctggtccatc actagtagag ccacagcaag agc 43

<210> 24
 <211> 6
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:6xHis
 C-terminal tag

<400> 24
 His His His His His His
 1 5